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EVERY MAN HIS OWN CATTLE
DOCTOR.



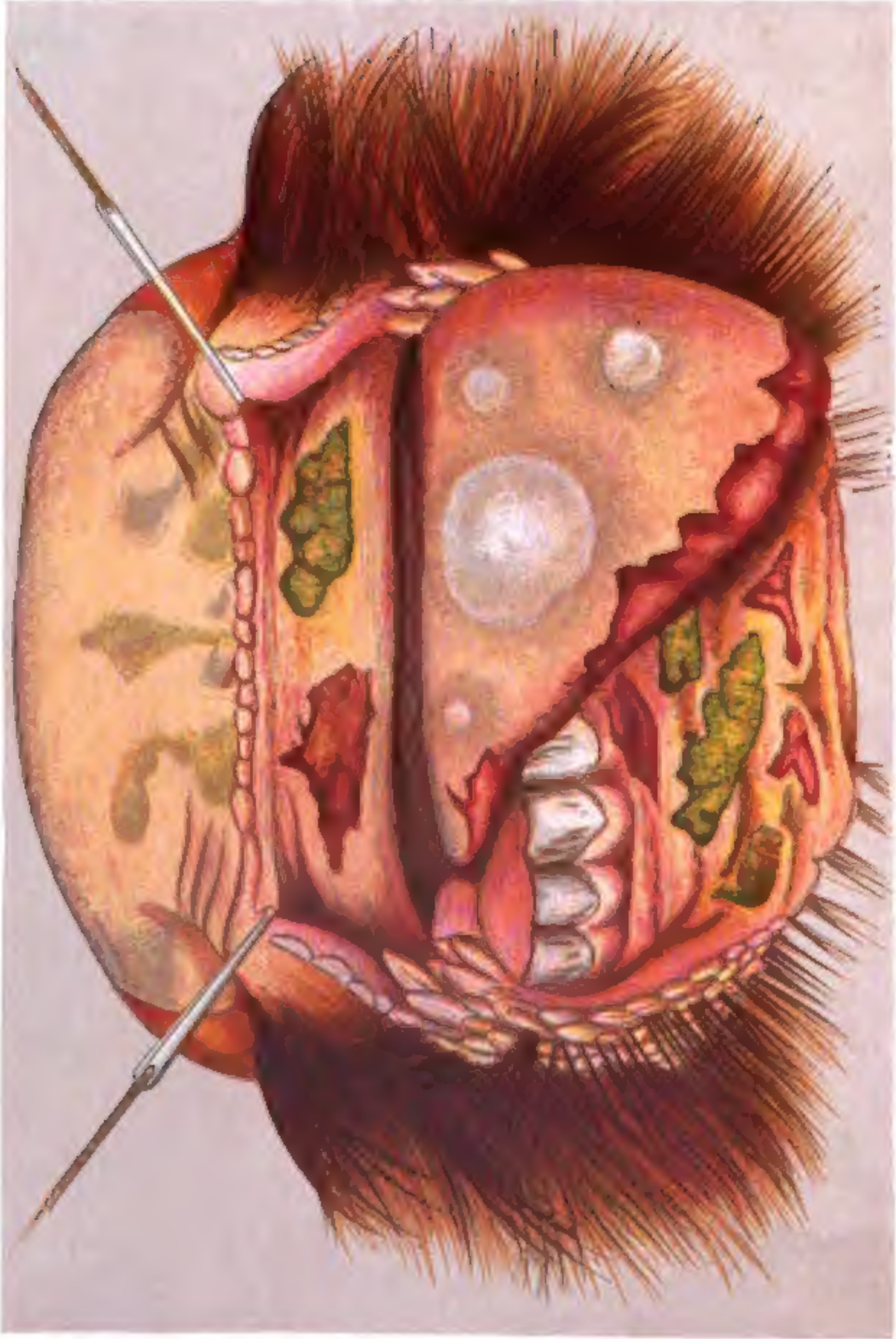


PLATE I.—The Mouth in Epithelioid Aphthae.

104. 2. 100

AN. 100. 100. 100.



104. 2. 100.



PLATE 1.—The Mouth in *Leper* *Aphtho*

104. 2.



FIGURE 1.—The Mouth in Leprosy. (Aphthae)

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11

104.2

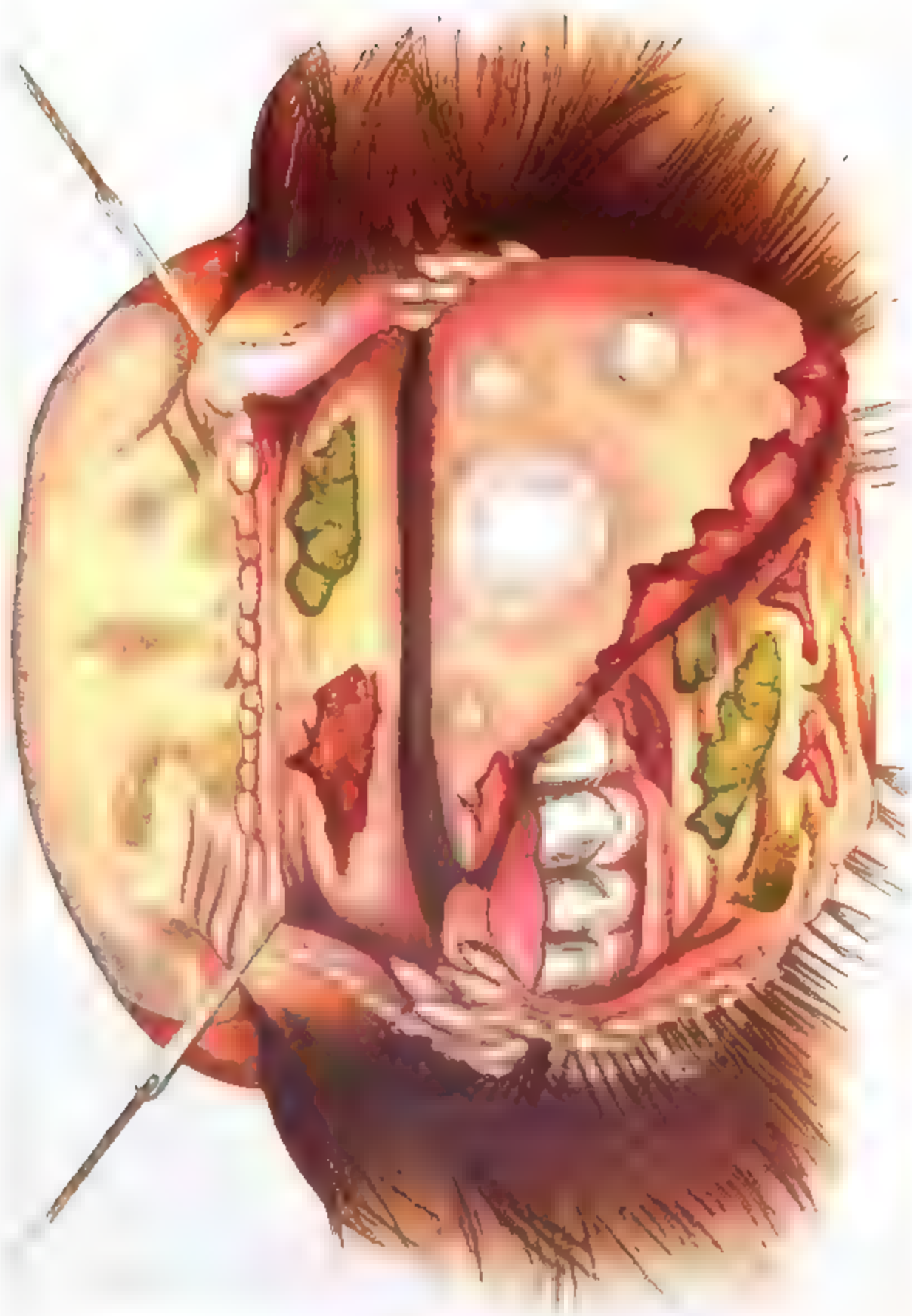


FIGURE 1. The Mouth in 1 pt. out. Aphtho

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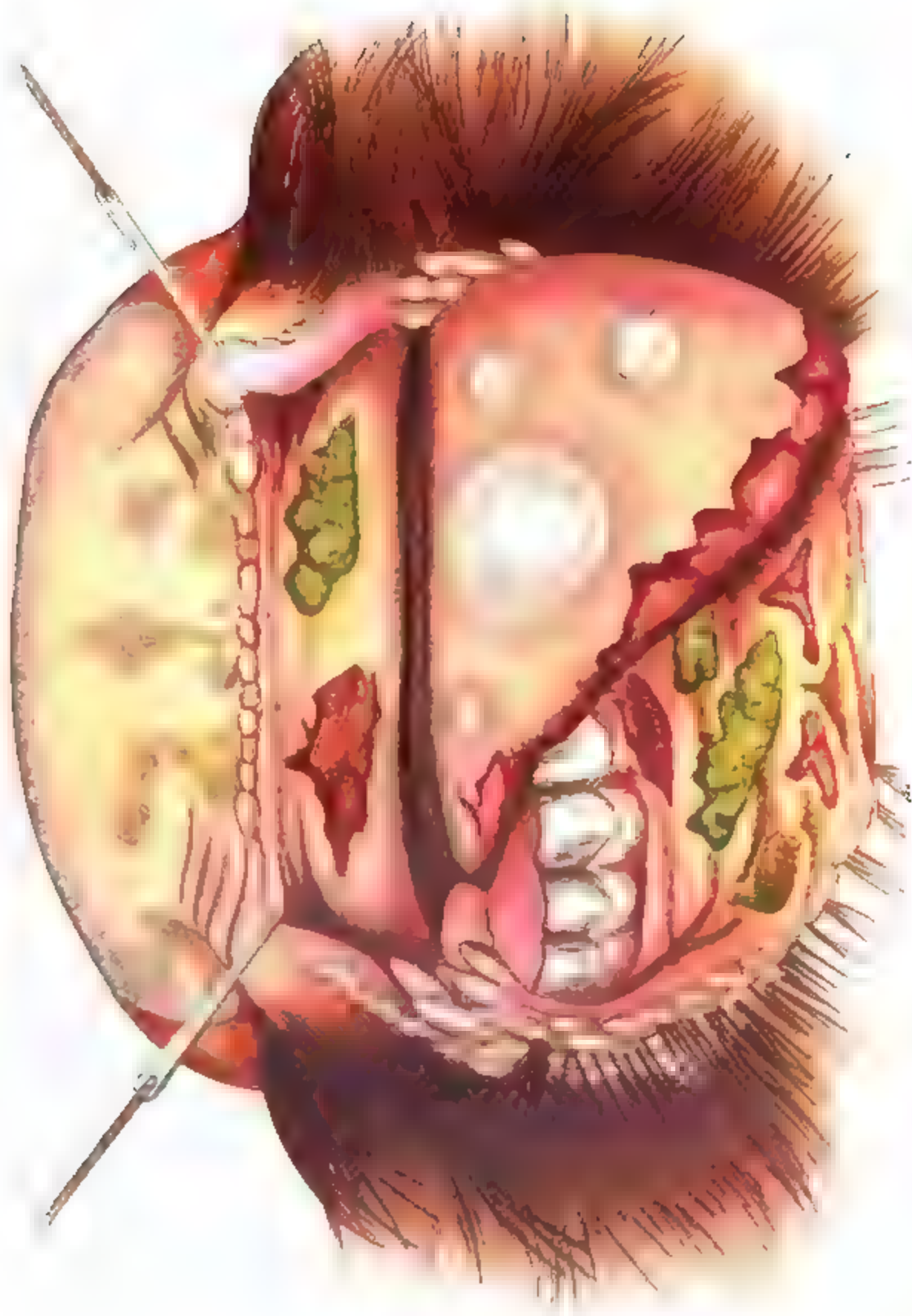


FIG. 1. The Mouth in Erythema Aphthae.

EVERY MAN HIS OWN CATTLE DOCTOR.

BY
FRANCIS CLATER.

ENTIRELY RE-WRITTEN TO THE PRESENT DATE

BY
GEORGE ARMATAGE, M.R.C.V.S.

WITH COPIOUS NOTES, ADDITIONAL RECIPES, ETC.

AND UPWARDS OF
TWO HUNDRED PRACTICAL ILLUSTRATIONS,
SHOWING FORMS OF DISEASE AND TREATMENT.



LONDON:
FREDERICK WARNE AND CO.

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1870.

189. e. 54.



EDITOR'S PREFACE.

In the existence of eight and a half millions of horned stock, forty millions of sheep, and five millions of pigs, worth, at a low computation, no less than one hundred and thirty millions of money, we discover ample encouragement for studying and attempting to expound means by which that as yet unparalleled mass can be caused to be as remunerative as its representative value imperatively calls for. In order to acquire an efficiency in this particular, the nature and causes of disease, as well as structure and functions of the animal body, are paramount in the curriculum, and these pave the way to a rational system of treatment and prevention. It is a field in which the scientific veterinarian is pre-eminently at home, but at present almost withheld from him. Veterinary science has ministered too little to the welfare of the nation through its valuable stock, hence scarcity of adequate help where it is most required. But the fault, as one of omission or commission, is not attributable to her. Hitherto the dogmas and traditional mystifications of the farrier, cow-leech, shepherd, and cowman have been preferred, and many proprietors at this day tenaciously cling to a principle of wholesale drugging, while a rational plan of management is totally ignored. Thus far philosophical teaching has had no part in the work it is destined to fulfil; and its professors repudiate the charge

Preface.

of inefficiency and want of skill brought against them, while they are unemployed, unheeded, and untested.

This state of things, however, is undergoing a satisfactory change. Laudable movements are being made, and agriculturists are to be found equally as active in their desire and efforts for an improved system as the members of our commercial community. With their sanction and encouragement, scientific teaching is persevered in, and we rejoice to witness the successful working of the scheme long ago instituted by the Royal Agricultural Society of England, viz., the establishment of a Chair of Cattle Pathology in the Royal Veterinary College, London, so ably filled by Professor Simonds, whose efforts have been unremittingly directed towards cultivating and improving the study of that branch of science which takes cognizance of the diseases of cattle, sheep, and swine.

But this is not all. The agriculturists of Britain have exhibited tokens of activity in other parts. The Highland and Agricultural Society of Scotland have also established a Chair of Cattle Pathology in the Edinburgh Veterinary College. The Royal Agricultural College at Cirencester has also paid attention to the cultivation of teaching in veterinary science, and the contagion has already been caught by the Royal Dublin Society.

Under these evidences of increasing knowledge in agricultural matters we gather encouragement, and opine that, as our members increase in scientific knowledge of the diseases of animals, the more will their talents be found serviceable and acceptable; and not the least among the principles by which that end is gained is that which conveys an accurate idea of the vast importance of the question as connected with the live stock of Great Britain.

The nature and diseases of animals have been too little understood. That which has found most favour is the assemblage of vague statements and incongruous recipes. Our best

Preface.

writers—and the names of Blaine, Youatt, Dick, Coleman, Clark, &c., &c., evoke from us sentiments of veneration as pioneers in a great and glorious work—commenced a career amid a chaos of unmixed difficulties, and we marvel, not at the discrepancies that have resulted, but rather that their inculcations have been so little attended to. In following their labours, however, we work under a different dispensation, and hope to clear away a portion at least of the great cloud that has hung around so long. Our efforts, therefore, are an attempt at supplying suitable information upon the diseases of cattle, sheep, and swine, by paying particular attention to all known causes, as well as their prevention. The treatment has also met with a considerable share of attention, as pursued by the Author in his original works with so much success.

In addition, information has been given under the head of “*Post mortem* appearances” of animals which have succumbed to the various diseases. In this respect, the Editor feels that a mass of error may be swept away, if those parts are carefully appealed to. It has been too much the fashion to rest satisfied with a non-professional mode of examination, and signs, greatly mistaken, have obstructed progress in the right direction. With the first death on a farm, a prompt and careful *post mortem* examination should be made by competent veterinarians, and, after learning the cause, means may be instituted to avert the occurrence of additional disaster. Such would also afford a grand impulse to scientific teaching, and do away with an unwholesome and unprofitable system of drugging.

If the veterinary surgeon were employed on account of the sound advice he can convey, the agriculturist would find it a more advantageous proceeding, and the country at large greater resources in its agricultural wealth. Veterinary science and agriculture are inseparable: the former is the handmaid to the latter. For this cause, the Editor has endeavoured to

Preface.

illustrate with truth that which has been demanded at his hands, feeling certain that, to show that veterinary science is a simple matter, is to do it an injustice and the public an irretrievable wrong. The higher it can be regarded, the more valuable it must become to those who require its aid.

In the rapid strides which veterinary science has made, and for which we have to thank the efforts of the individuals and bodies already named, great improvements have taken place in the mode of treatment as well as estimate of disease. In this, as in each department comprised in the work, the Editor has endeavoured to be faithful. Where his experience—gained in various parts of the United Kingdom as a practitioner, and, later, as a teacher of veterinary science—was found insufficient, the opinions and evidences of other authorities, British and foreign, have been cited.

The subject of contagious or Epizootic diseases has met with an extended share of notice. In this department, the Editor experiences a deep conviction that great evils exist, and their eradication depends as much upon a harmonious agreement as to their nature, progress, and mode of introduction, as upon the much-to-be-desired unity of action among the agricultural body in its demands upon the Legislature. The prevalence of contagious diseases among cattle, sheep, &c., in consequence of extended commercial relations with the Continent of Europe, and our dependence upon its marvellous resources of live stock, now assumes the nature of a national calamity, the effects of which are neither slowly nor easily removed. Scarcity, famine, and fever succeed each other as inevitable results, and by them the agriculturist, who has not hitherto given his attention to the subject, may gather how much his influence, as one of a body scarcely cognizant of its power when properly directed, may minister to the welfare, comfort, and health of his fellow-creatures, as well as ensuring an immunity from fell disease among his flocks and herds.

•

Preface.

With such available material and assistance as already named, the work has been re-arranged as an attempt to meet the requirements of the present day; but how far successful is left to the judgment of others. Of the numerous imperfections which, as in all human endeavours, are inevitably present, the Editor is fully conscious, but entertains the hope that they will be regarded as venial.

In the undertaking it was found impossible to dispense with many medical terms, or supply language equally as expressive, without greatly disturbing the general flow of description, adding too much, and incurring a wearisome repetition; but, in order to overcome certain inconveniences consequent thereon, a copious Glossary has been given at the end. These, with numerous additions, and illustrations taken from the Editor's original drawings—for which thanks to Mr. H. Stannard and the Messrs. Dalziel—may possibly recommend themselves.

G. A.

EASTLAKE ROAD, CAMBERWELL, S.E.
1870.

CONTENTS.

	<i>Page</i>
PREFACE	v
LIST OF ILLUSTRATIONS	xv

SECTION I.

THE BLOOD. — Circulation — Heart — Capillaries — Arteries — Veins— Colour — Density — Blood-discs — Coagulation—Liquor sanguinis— Temperature—Blood in health—The pulse—Where felt—Difference in animals—How influenced—The pulse in disease—Variations or characters—Frequency, volume, &c.—Venous pulse—Simple or com- mon fever—Causes—Symptoms—Treatment—Symptomatic fever— Nature—Causes—Symptoms—Treatment—Inflammation—Nature and definition—Kinds of inflammation—Symptoms—Causes—Ter- minations—Treatment—Abstraction of blood.	1—41
--	------

SECTION II.

BLOOD DISEASES. — Plethora — Anæmia — Rheumatism — Uræmia — Apnoea—Tuberculous Consumption — Cancerous ulcers—Purpura hæmorrhagica—Malignant catarrh—Arthritis—Asthenic hæmaturia —Malignant sore throat—Measles—Scarlatina—Enzoötic diseases— Anthrax or carbuncular fevers—Carbuncular erysipelas—Nerving and worming, an imposture—Splenic apoplexy—Braxy—Gloss-anthrax— Hog-cholera—Apoplexy in pigs—Anthraxoid diseases—Parturient apoplexy in cows—After-pains in ewes—Red-water in sheep and lambs—Navel-ill—Summary of general treatment of Enzoötic diseases —Epizoötic diseases—Rinderpest or Cattle Plague—Epizoötic pleuro- pneumonia—Epizoötic aphtha—Variolous fevers—Small-pox—Cow- pox—Chicken-pox—Mortality from Epizoötic diseases—Measures re- quired for their suppression—Regulation of importation—Quarantine —Foreign stock markets—Inspection—Suppression of illicit trade in diseased meat and cattle—Slaughter—Indemnity—Stoppage of fairs and markets—Sanitary measures	43—217
---	--------

Contents.

SECTION III.

DISEASES OF THE RESPIRATORY ORGANS.—Simple catarrh—Sore throat or laryngitis—Croup—Tracheotomy—Insufflation—Bronchitis—Rhoncus—Peripneumony, pneumonia, or inflammation of the lungs—Abscess of the lungs—Pleurisy—Hydrothorax or water in the chest—*Paracentesis thoracis* or tapping the chest—Sporadic pleuro-pneumonia—Its analogy to the Epizoötic form—Emphysema of the lungs. 219—258

SECTION IV.

DISEASES OF THE DIGESTIVE ORGANS.—Injuries to the mouth—Drenching—Sporadic aphtha or thrush—Glossitis or inflammation of the tongue—Ulcerated tongue—Abscess, induration, gangrene, and paralysis of the tongue—Indigestion—The stomach and its compartments—Fog-sickness, hoven, or acute tympanitis—Chronic tympanitis—Obstructions of the gullet—Choking—Sacculous dilatation—Rupture—Impaction of the rumen—Maw-bound or grain-sick—Rumenotomy—Foreign bodies in the rumen—Affections of the second stomach (reticulum)—Impaction of the omasum—Fardel-bound—Grass-staggers—Obstinate constipation in pigs—Chronic indigestion—Dyspepsia—Dropping the cud—Fragility of bones—The *cachexia ossifraga*—Constipation—Colic—Diarrhoea—Dysentery or bloody flux, acute and chronic—Chockered animals—Enteritis—Gastro-enteritis—Croupous enteritis—Peritonitis—Imperforate anus (*Proctatresia*)—Protrusion of the rectum—Prolapsus ani—Hæmorrhoids or piles—Hernia or rupture—Navel, phrenic, and mesenteric hernia—Volvulus or invagination of the intestines—Strangulation or gut-tie in oxen—The spleen or milt—Pancreas or sweetbread—Jaundice or yellows—Congestion of the liver (*Hyperæmia*)—Inflammation of the liver (*Hepatitis*) 259—353

SECTION V.

DISEASES OF THE URINARY ORGANS.—Urine, its composition and variation in health—Density—Temperature—Reaction—Constitution—Analysis—Functional disorders—Diabetes or profuse urination—Obstructions to the flow of urine—Retention of urine—Mode of removal by artificial openings in male animals—Incontinence of urine—Pervious urachus—Albuminous urine—Structural changes as a result of disease—Hæmaturia or bloody urine—Sthenic hæmaturia—Nephritis or inflammation of the kidneys—Changes in form and structure of the kidneys—Atrophy—Hypertrophy—Abscess—Fistula—Cystitis or inflammation of the bladder—Lithiasis or gravel—Constitution,

Contents.

cause, &c.—Appendix vermiformis in sheep—Renal, ureteral, vesical, urethral, and preputial calculi or stones—Prolapsus vesicæ or inversion of the bladder 355—396

SECTION VI.

DISEASES OF THE ORGANS OF GENERATION.—Abortion—Premature labour—How to extract a calf—False or preternatural presentations—Different forms—Hydrocephalus—Ascites or abdominal dropsy—Post or after-labour pains in the cow and pig—To extract the placenta or secundines—Flooding or hæmorrhage after parturition—Vaginal hæmorrhage—Uterine hæmorrhage—Metro-peritonitis or true puerperal fever—Inversion of the vagina—Inversion of the womb—Vaginitis or vaginal catarrh—Leucorrhœa or the whites—Gonorrhœa or the clap, bull-burnt, &c.—Mammitis or downfall of the udder—Mammitis in ewes and sows 397—440

SECTION VII.

DISEASES OF THE NERVOUS SYSTEM.—Phrenitis or inflammation of the brain—Apoplexy—Epilepsy—Hydro-rachitis or louping-ill in sheep, &c.—Paralysis—Paraplegia—Hemiplegia—Rabies or hydrophobia—Tetanus—Trismus—Locked-jaw—Opisthotonos—Emprosthotonos—Pleurosthotonos—Nervous debility in cows—*Adynamia nervosa generalis*, its analogy to metro-peritonitis and parturient apoplexy—The tail-worm—Its extraction an imposture . . 441—463

SECTION VIII.

DISEASES OF THE ORGANS OF CIRCULATION.—Anæmic palpitation—Murmurs—Ruptures of the heart—Cyanosis or the blue disease—Congenital malformations and displacement of organs—Ectopia cordis—Carditis—Pericarditis—Foreign bodies in the heart—Endocarditis—*Bruit-de-souffle*—Hypertrophy or enlargement of the heart—Embolism 465—477

SECTION IX.

DISEASES OF THE SKIN AND ITS APPENDAGES.—Inflammation of the skin—Dermatitis—Erythema or Exanthema—Simple erythema—Erythema intertrigo—Chronic erythema—Sore teats—Erysipelas—Urticaria—Stinge—Prurigo—Eczematous or vesicular forms of erythema—Simple eczema—Chronic eczema—Bulbous eruptions—Pemphigus—*Herpes circinatus*, vesicular or false ringworm—Pustular forms of erythema—*Impetigo larvalis*—*Impetigo facialis*—Ecthyma—Furuncular inflammation—Diseases of the cellular tissue—Hide-bound—Angle-berries—Foot-halt, foul, foot-rot, *paronychia ovium* and *paronychia boum* 479—504

Contents.

SECTION X.

PARASITIC DISEASES.—General remarks—Phthisis pulmonalis verminalis or hoose—Origin and migration of parasites—Attacks of distoma hepaticum, the fluke disease or rot in sheep—Prevalence—Mortality—History, &c.—Gid, sturdy, turn-sick, &c.—Measles, so called—Scab in sheep—Mange in cattle—Mange in the pig—Sheep lice, ticks, and maggots—Lice in cattle—Sheep-dipping and smearing, and the result of using poisonous preparations—Remedies employed in dipping and smearing sheep—True ringworm, *trycophites tonsurans*—Warbles or wournils 505—574

SECTION XI.

DISEASES OF THE ORGANS OF VISION AND THEIR APPENDAGES.—Ophthalmia — Corneitis — Conjunctivitis — Retinitis — *Membrana nictitans*—Foreign bodies in the eye—Enzoötic ophthalmia—Albugo, or opacity of the cornea—Staphyloma, or bulging of the cornea—Fungous hæmatodes or bleeding cancer—Removing the haw or “hacks” an imposture 575—586

SECTION XII.

LOCAL INJURIES.—Wounds — Incised wounds — Interrupted suture — Uninterrupted suture—Quilled suture—Lacerated wounds—Double many-tailed bandage—Contused wounds—Spongio-piline—Punctured wounds—Wounds of arteries and veins—Hæmorrhage — Phlebitis —Thrombus—Fractures, transverse, oblique, compound, and comminuted—Starch bandages—Fracture of the haunch-bone—Sprain of the round ligament of the hip joint—Injuries to the femoro-tibial articulation, or stifle-joint — Rheumatic arthritis — Dislocation of the patella or knee-cap—Sprains of tendon 587—606

SECTION XIII.

POISONS.—Toxicology—Simple irritants—Chemical or corrosive irritants — Nervine poisons—Narcotico-acrids—Poisoning in empirical practice—Accidental poisoning—Wilful and malicious poisoning—Symptoms of poisoning—Treatment, &c. 607—616

APPENDIX.

REMEDIES EMPLOYED IN THE TREATMENT OF THE DISEASES OF STOCK GENERALLY: THEIR USES AND APPROPRIATE DOSES, &c.—The lambing season—Treatment of ewes and cows during pregnancy —Summary of the preparations given throughout the work—Explanation of terms used, &c., &c. 617—644

INDEX 645

LIST OF ILLUSTRATIONS.

	<i>Page</i>		<i>Page</i>
1. Blood-discs magnified	5	24. Asthenic Hæmaturia or Red	
2. Circulating Blood	8	Water	83
3. Blood in Inflammation.....	22	25. Malignant Sore Throat.....	87
4. Single Many-tailed Bandage.	34	26. Tenaculum or Hook	89
5. Seton Instruments.....	37	27. Scalpel.....	89
6. A Seton inserted	38	28. Tracheotomy Tube	89
7. Do. do.	38	29. Do. do. placed in	
8. An Ox prepared for Bleeding	40	Neck	89
9. The Twisted Suture	40	30. Endermic Syringe and Needle	90
10. Instrument for Pointing Pins.	41	31. { Funnels for passing Medi-	
11. Bones of the Knee, from an		32. { cines into the Veins.....	90
Ox after Chronic Rheuma-		33. Apparatus for making Chlo-	
tism	53	rine Water.....	91
12. Cow affected with Rheumatism	54	34. Carbuncular Erysipelas —	
13. Cow suffering from Phthisis...	60	Black Leg or Quarter-ill ...	101
14. Cliers of Parotid Gland	63	35. The common subject of Sple-	
15. Bull with Disease of Superior		nic Apoplexy	106
Maxillary Bone.....	63	36. Braxy, last stage	109
16. Cow with Disease of Inferior		37. Situation of Facial Vein in	
Bone	63	Sheep	110
17. Bull after Removal of Tumour		38. Gloss-Anthrax or Blain	113
from Face	63	39. Hog-Cholera.....	115
18. Glass Syringe.....	66	40. The state of Coma in Partu-	
19. Purpura Hæmorrhagica	67	rient Apoplexy.....	120
20. Malignant Catarrh, first stage	72	41. Stomach-pump in use	123
21. Do. do. last do.	73	42. Catheter to draw off Urine...	123
22. Arrangement of Healthy Bone		43. Sheep affected with "Heaving	
Structure	76	Pains"	125
23. Bone enlarged from Tuber-		44. Navel-ill, so called	127
cular Deposit, and hollowed		45. Rinderpest, earlier stage.....	139
by subsequent Abscess ...	77	46. Do. advanced stage	140

List of Illustrations.

	<i>Page</i>		<i>Page</i>
47. Epizoötic Pleuro-pneumonia	147	74. Preparation for Tapping the	
48. Diagram showing the Ar-		Chest.....	246
rangement of the Struc-		75. Trocar and Canula	247
ture of the Lungs	151	76. Drawing Fluid from the	
49. The Dutch Cow, so called ...	155	Chest.....	247
50. Friends from Ireland	157	77. Sporadic Pleuro-pneumonia	251
51. Epizoötic Aphtha, or "Foot		78. Emphysema of the Lungs...	254
and Mouth Disease"	159	79. Appearances shown on a Sec-	
52. Epizoötic Aphtha — indica-		tion of the Lungs when	
tions of the Feet being af-		Emphysematous	257
fected.....	160	80. The objectionable Drenching-	
53. Mode of applying Dressings		horn	262
to the feet of Cattle.....	165	81. A common method of Chok-	
54. Teat Syphon	166	ing Cattle	263
55. Mode of injecting Fluids into		82. Paralysis of Tongue	264
the Udder.....	166	83. Compartments of the Sto-	
56. Foreign Sheep and Goats...	171	machs of Ruminants	268
57. Small-pox, eruptive stage ...	173	84. Acute Tympanitis or Hoven	271
58. Do. confluent do. ...	174	85. Wooden Gag for the Mouth	273
59. Cow-pox.....	177	86. Iron do. do. ...	273
60. Teat Syphon.....	178	87. Preparations for passing the	
61. Apparatus for Generating		Stomach-pump or Probang	273
Chlorine Gas	210	88. Trocar and Canula for	
62. Apparatus for Disengaging		piercing the Stomach, or	
Sulphurous Acid Gas	213	"Paunching"	274
63. Instrument for Purifying the		89. Place for Puncturing the	
Air of Buildings	214	Stomach	275
64. Simple Catarrh.....	223	90. Trocar and Canula for	
65. Mode of applying Steam to		Paunching Sheep	276
the Nostrils	225	91. Wooden Gag used in Choking	279
66. Mode of applying Steam to		92. Iron do. do. ...	279
the Nostrils	226	93. Method of Securing the Ani-	
67. Laryngitis (Sore Throat) ...	228	mal	279
68. Animals affected with Bron-		94. Forceps used in Choking ...	280
chitis	234	95. Saccular Dilatation of the	
69. Sporadic Pneumonia, acute		Gullet	281
stage	238	96. The Gullet after Dissection .	282
70. Sporadic Pneumonia, later		97. Distention of the Rumen by	
stage	239	Food	283
71. Sporadic Pneumonia, last		98. The "Bulldogs" as they are	
stage	239	used	285
72. Abscess in Lungs	241	99. The Rumen exposed for Re-	
73. Acute Pleurisy	243	moval of its Contents ...	286

List of Illustrations.

	<i>Page</i>		<i>Page</i>
100. Left View of the Stomach, showing Tumour between First and Second Compartments.....	289	128. Removal of Urine by an Artificial Opening	368
101. Impaction of the Omasum.	294	129. Traumatic Albuminuria ...	369
102. Chronic Indigestion	301	130. Idiopathic do.	370
103. "Dropping the Cud"—Dyspepsia	303	131. Traumatic Hæmaturia	373
104. Fragility of Bones, a result of Dyspepsia	305	132. Sthenic do.	376
105. Rib, showing previous Fracture and Union afterwards	307	133. Nephritis.....	379
106. The Pelvis or Haunch-bones under Deposit and Deformity from Disease	307	134. Kidney of the Ox	384
107. Thigh-bone or Femur, Diseased, and forming False Joint by Disunited Fracture	307	135. Do. Sheep.—Sections	384
108. Diarrhœa.....	310	136. Cystitis, or Inflammation of the Bladder	386
109. Acute Dysentery	317	137. Urinary Passages of the Ox	392
110. Chronic do.	318	{ Various forms in which the	
111. Gastro-enteritis	323	{ Ammonio - Magnesians	
112. Peritonitis	330	139. { Phosphatic Calculi are	
113. Imperforate Anus, 1st form	331	140. { found. (139 and 140 are	
114. Do. 2nd do.	331	{ Sections)	393
115. Do. 3rd do.	331	141. Inversion of the Bladder ...	396
116. Method of holding Pigs for Operation for Imperforate Anus	332	142. Preternatural position of the Calf in the Womb	405
117. Protrusion of the Rectum...	335	143. Do. do. ...	407
118. Umbilical Hernia	340	144. Double Parturition Hooks .	407
119. Truss applied for do.	341	145. Single do. .	407
120. Wooden Clamps for do.	341	146. Preternatural position of Calf	408
121. Iron Screw Clamps for do....	341	147. Do. do.	409
122. Invagination of the Intestines	344	148. Do. do.	410
123. An Ox prepared for Casting	346	149. Do. do.	411
124. The Fainting-Fit	353	150. Do. do.	412
125. Urinometer.....	359	151. Do. do.	413
126. Catheter for Removing the Urine from the Bladder...	366	152. Do. do.	414
127. Urethral Canal of Ox	367	153. Hydrocephalus in unborn Calf	415
		154. Ascites or Abdominal Dropsy in Calf	416
		155. Concealed Knife.....	416
		156. Flooding after Parturition...	421
		157. Metro-peritonitis	423
		158. Injection of Fluid into the Stomach	425
		159. Method of preventing Secondary Inversion of the Vagina	427

List of Illustrations.

160. Inversion of the Womb.....	Page 429	195. The Eye and its Muscles...	Page 577
161. (Same as 159.)		196. Ophthalmia.....	580
162. Method of Supporting the Udder in Mammitis	437	197. Forceps for Extracting Foreign Bodies from the Eye	582
163. Teat Siphon	437	198. Use of the "Bulldogs" ...	582
164. Mode of Injecting the Milk Gland	438	199. Staphyloma	584
165. Epilepsy in the Pig.....	446	200. Fungous Hæmatodes	585
166. Hydro-rachitis	449	201. The Eyeball partially covered by the "Haw"	586
167. Rabies.....	453	202. Twisted Suture	590
168. Locked Jaw.....	456	203. Interrupted do.	590
169. Opisthotonos	457	204. Uninterrupted do.	590
170. Emprosthotonos	458	205. Suture Needle.....	590
171. Pleurosthotonos	458	206. Quilled Suture	591
172. Nervous Debility after Parturition	459	207. Double Many-tailed Bandage	592
173. Pericarditis	472	209. Transverse Fracture of Bone	597
174. (Same as 163.)		210. Oblique do. do. .	597
175. Method of Supporting the Udder	485	211. Stifle Joint after severe injury	601
176. Erysipelas	486	212. Ox with Injury to Stifle Joint	601
177. Psoriasis or "Rat-tails" ...	490	213. Dislocation of Patella	603
178. Vesicular Ringworm	492	214. Mode of Securing the Hind Leg, to prevent re-dislocation of the Patella	604
179. Crust or Scab of do.....	492	215. Gastro-enteritis from Poison	612
180. Ecthyma	495	216. Condition induced by Lead and many Vegetable Poisons	613
181. Small-pox	495		
182. Do.	495		
183. Interdigital Ligament	501		
184. Foot-knife	502		
185. Mode of Dressing for "Foot-rot"	503		
186. Hoof, showing Proper Line of Ground Surface	504		
187. Diarrhœa in Lambs	513		
188. The Rot	521		
189. Brain of Sheep, showing Cysts of Tapeworm	526		
190. Cyst of Tapeworm, enlarged view, with Scolices	526		
191. Scab or Mange	546		
192. Scab or Mange Insect	550		
193. True Ringworm.....	571		
194. Section of the Eyeball	577		

APPENDIX.

217. Drenching-horn	626
218. Mode of Forming a Pouch with the Cheek.....	627
219. Drenching-bottle	627
220. Method of Holding Young Pigs for the Administration of Medicines	627
221. Method of Securing Large Pigs	628

List of Illustrations.

<p>222. Gamgee's Enema Funnel, as modified by Dickinson ...</p>	<i>Page</i>	629	<p>224. Ried's Patent Syringe, fitted with Tobacco-smoke Ap- paratus</p>	<i>Page</i>	630
<p>223. Ried's Patent Syringe</p>	629				

COLOURED PLATES.

I. <i>Frontispiece</i> .—THE MOUTH IN EPIZOOTIC APHTHA (or Foot and Mouth Disease).	
II. HOG CHOLERA	<i>facing page</i> 116
III. THE LUNGS UNDER INFLAMMATION	,, 153

ERRATA.

<i>Page</i>	
58,	line from top, 10—for <i>loooking</i> read <i>looking</i> .
70,	,, under cut— for <i>malignant</i> read <i>malignant</i> .
153,	,, from top, 1—for Plate <i>II.</i> read <i>III.</i>
231,	,, from bottom, 6—for <i>mussel</i> read <i>muzzle</i> .
289,	,, " 6—for <i>Andersen</i> read <i>Anderson</i> .
318,	,, from top, 6—for <i>subject</i> read <i>subjects</i> .
604,	,, " 6—for <i>extremities</i> read <i>fore extremities</i> .

SECTION I.
THE BLOOD.

THE BLOOD.

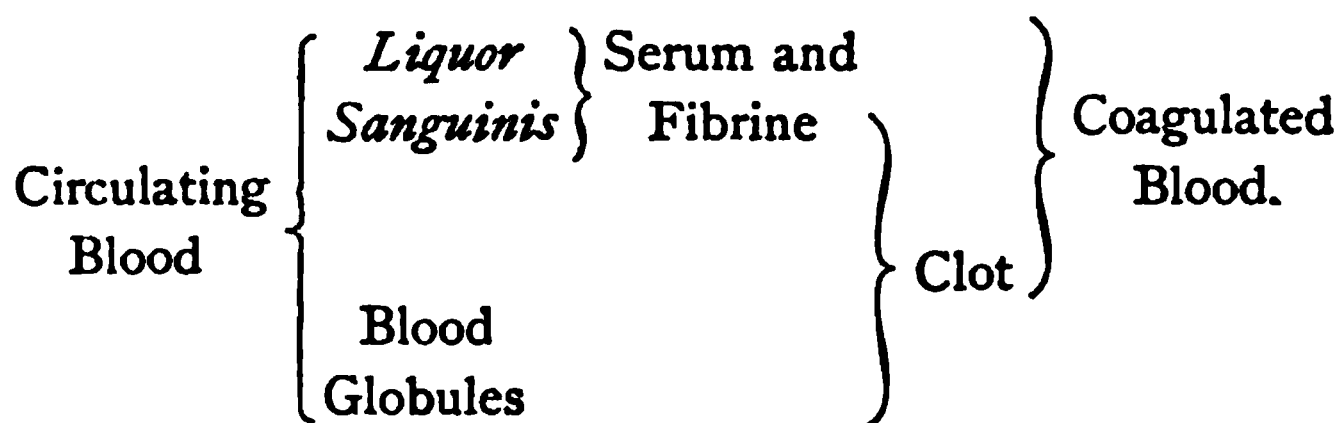
[THE blood is the coloured fluid that circulates through the whole of the body by means of appropriate vessels, carrying nourishment which it derives from certain processes that are exerted upon the food taken into the digestive organs. The properties and functions of the blood may be briefly enumerated as follows :

The CIRCULATION or MOVEMENT is designed as an effective means whereby the nutritious materials are properly conveyed to all parts, in order to nourish the various tissues and provide for their growth and maintenance. It also admits of the return to the proper centre of various useless or *effete* materials that are constantly being poured into it as a result of an incessant change or decay of the different tissues of the body. The blood, therefore, not only contains elements of nutrition, but also substances no longer useful to the system, and circulation or movement likewise facilitates and promotes their exit from the body.

The heart is the great organ of propulsion. It receives constant supplies of blood by means of a special cavity called a ventricle, on its right side, and by forcible contraction distributes it through the lungs, where, by the influence of the atmosphere in respiration, it becomes charged with oxygen, and is purified. From thence the blood returns to the ventricle on the left side of the heart, and by further contractions is distributed over the body by means of special tubes or vessels

called arteries. These, by constant subdivision into numerous branches, become so small, that their diminutive size has claimed for them the name of capillaries or *hair-like* tubes, in which many important chemical and vital changes are incessantly going on. These are, principally, distributing nourishment and receiving the useless particles already alluded to, and from which the colour of the blood is changed from its bright and beautiful scarlet to a darker or Modena colour. Passing from these capillaries, the tubes begin to enlarge and decrease in number until, finally, the fluid reaches a main trunk of the system, called a vein, by which it returns to the heart.

DENSITY OF THE BLOOD.—The specific weight or gravity of the blood, as compared with water, varies from 1·052 to 1·057. This property is derived from the different parts that enter into its composition. The following diagram shows the condition of the blood under two aspects—circulation and coagulation :



In further elucidation, the following remarks are necessary : If a minute drop of blood is examined under the magnifying power of a microscope, it will be found to consist of two portions : one a solid, or apparently solid, floating in the second—a clear fluid. Under closer inspection it will be observed that the solid portion is made up of a number of separate particles called blood discs, blood particles, blood globules, &c. These vary in size in different animals, being about $\frac{1}{1000}$ of an inch in diameter in the ox or horse ; in the dog they vary from

to 1000; in the elephant, 500; musk deer, 1000; dromedary, 500; goat, 500; reptiles from 1000 to 1000; fishes, 1000 to 1000; birds, 1000 to 1000. The thickness is about one-fourth of their width. In shape these globules are flat and circular, with some exceptions in mammals—hence their name, blood discs (Fig. 1). Among the lower orders of animals they are

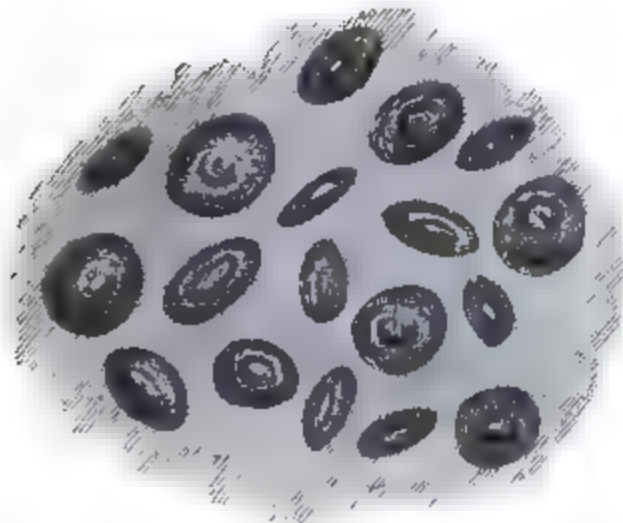


FIG. 1.—*Blood-discs or Red Globules.*
Enlarged View. Natural size about 1-4000th of an inch in diameter.

oval, and in reptiles each disc or globule contains within itself a nucleus or secondary cell for the purpose of reproduction. Besides these coloured discs there are others (colourless globules), in the proportion of about one to thirty of the former.

The clear fluid in which the globules float is called *liquor sanguinis*, or blood liquid: it has a mucilaginous consistence, a yellow colour, and is separable into two portions outside the body—serum and fibrine, the latter of which undergoes a process of solidification known as coagulation, and, by surrounding the blood discs, carries them down with it to the bottom of the vessel after a little time has elapsed. The fluid then appears in two parts: the *clot* or *crassamentum* at the bottom, with a clear yellow-looking fluid at the top, *serum*—the whole constituting coagulated blood.

It is not our intention here to discuss the various arguments

relative to the process and cause of the coagulation of the blood. The fact of such a result being inevitable is of great importance, not only as an evidence of the effect of external causes upon it, when removed from the body, but also as explanatory of morbid states *within* the organs of circulation during life—references to which will be made throughout the work. The causes of the coagulation of blood appear to be due to vital as well as chemical influences. These are, loss of the effects of living tissues and propelling action of the heart and blood-vessels, as well as the power of maintenance which is conferred upon the blood within the body; contact with foreign bodies or tissues rendered inanimate or devitalized by injury, and multiplication of such points of contact; rest, as favouring a physical separation of the heavier particles from the lighter ones; attraction of the heavier particles for each other, &c.

The *liquor sanguinis*, besides containing fibrine, also contains a principle called albumen, with water and various salts, fatty and other adventitious matters, certain gases, &c. The proportions are: of water from 730 to 815 parts in 1,000; of albumen, 6 to 9 per cent.; fibrine, 3 or 4 parts in 1,000; of fats, in accordance with the mode of feeding, 4 to 5 parts in 1,000 in the ox and calf, and 1 to 2 parts in 1,000 in the horse. Of the various salts and organic principles great variation is observed, their presence depending greatly upon the mode of life, kind and quality of food, activity of functions, &c.

In all the higher animals blood is *warm*, having a temperature which varies in accordance with the kind of animal, as well as from the vigour of vital forces within. The origin of heat is due to chemical changes that result in the blood, by the presence of materials capable of effecting union with each other. These materials may be chemical and vital, and being brought into contact under the presence and influence of vital powers, heat is given out, just as the percussion cap is warmed after explosion by the stroke of a hammer, although both were pre-

viously cold. The temperature of the blood is a safe guide to the state of the system in general. It is communicated to the tissues, and the whole body is warmed. Decline of function, whether it arises as a result of disease, starvation, &c., is inevitably shown by decline of temperature of the blood and body as a whole. It points to an obstruction of proper nutrition—the incomplete passage of the elements of food into the blood ; to an arrest of chemical and vital action ; to impregnation of the blood with poisonous materials ; to a want of maintaining or purifying power on the part of the blood or certain organs, &c. A proper elevation of temperature is consistent and correlative with healthy function, and the influences of disease and other actions that take place within the organism, also bring about certain elevations and fluctuations known as diurnal variations, a knowledge of which proves of very essential service to the veterinary surgeon.

The temperature of animals in health we have found as follows : *

Animals.	Average during confinement.	Average during work or at liberty.
Sheep	102 5-10ths.	104 5-10ths.
Lambs	Undetermined.	104 9-10ths.
Pigs	101 6-10ths.	103 2-5ths.
Oxen and cows ...	100 4-5ths.	101 4-5ths.
Calves and stirks...	100 9-10ths.	101 9-10ths.
Dogs	99 3-10ths.	101 2-10ths.
Horses	99 2-10ths.	100 3-5ths.

The maintenance of a proper circulation of the blood and propagation of animal temperature is of vast importance in ensuring a healthy condition. Circulation and temperature

* "The Thermometer as an aid to Diagnosis." London: H. Kimpton. ; Edinburgh: Maclachlan & Stewart.

bear a certain, but by no means an invariable, relation to each other, and therefore a knowledge of the essential characters of the blood, and its connection with such vital forces as are influenced by its changes, becomes of paramount importance to all who desire to understand and treat properly the diseases of the animal body. It is, however, impossible to do more than epitomize the various portions and details of the subject

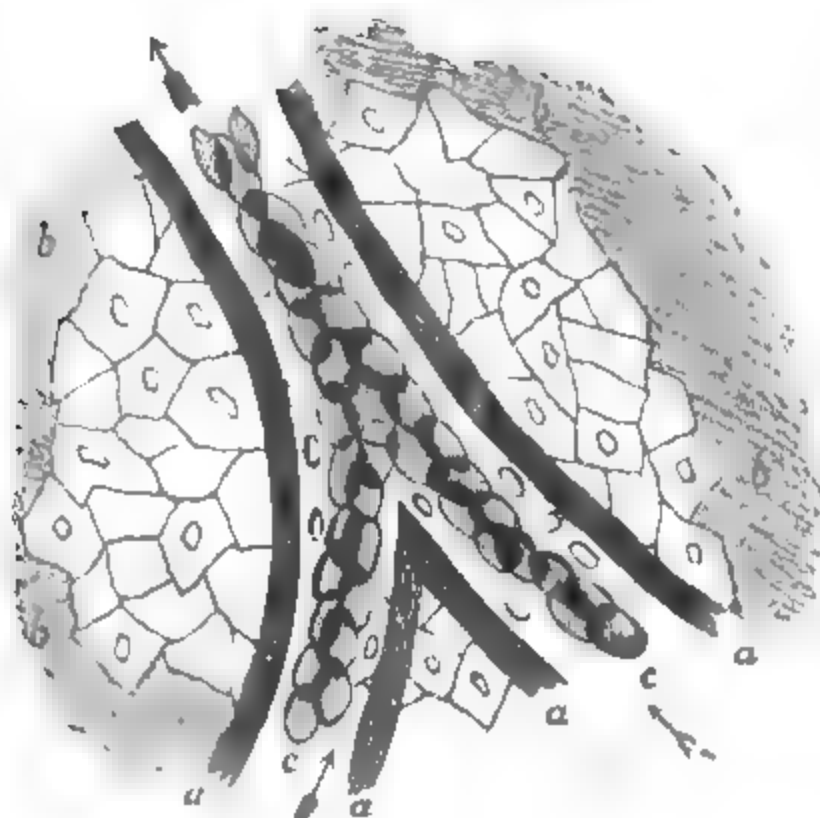


FIG. 2.—*Circulating Blood.*

in the space comprised within the limits of a volume devoted to a disquisition on the diseases of cattle ; but on that account we hope not to depreciate the profundity and weight of a department of science that hourly ministers so closely to the well-being and success of our social economy.

In the circulation of blood through the blood-vessels in health the current is very accurately regulated by means of various agencies—the elastic nature of the arteries, pressure of surrounding tissues, force of the heart's action from behind

and an aspiratory or drawing power in front, capillary attraction, consistence of the blood itself, being essential and instrumental to proper performance. In the accompanying diagram the state of healthy circulation is shown. The current of the blood is indicated by the arrows. *a a* are the walls of the blood-vessel; *b b b*, tissue, from its form and composition termed cellular, in which the vessel is embedded; *c*, the red globules, maintaining a steady and uniform current through the *centre* of the tube. Upon their outside is shown a number of white or colourless globules, moving at a slower rate. The clear space surrounding the stream of red globules is occupied by the fluid portion of the blood — *liquor sanguinis*. The drawing is a representation of what is seen in the web of a frog's foot by means of the microscope, and that which occurs in every part of the bodies of all animals.—*Ed.*]

THE PULSE.

[The flow of blood is constant and rapid. In order to prove this fact, certain substances of a chemical character, and remarkable for being easily detected, have been injected within the jugular vein of one side, and after the lapse of a given time, blood has been drawn from the opposite vein for testing. It is thus certain that the blood has traversed the whole of the body, and the results of various experimenters have proved that the time occupied in the horse and ox is about 20 seconds; dog, 15; goat, 12; and the rabbit between 6 and 7 seconds.

The great agent of circulation, as we have already said, is the heart. It is a large hollow muscular organ, divided into separate compartments for the reception of the blood; and by alternate dilatations and contractions, assisted by valves, the current is confined to one direction. The arteries receive the blood as it leaves the heart, and the impulse arising from the

pressure of an extra quantity within them is communicated first to the column of fluid already within the tube, and next to the elastic walls, causing them to expand rapidly, and immediately contract to their previous calibre. These alternate expansions and contractions are continuous, entirely in accordance with the action of the heart, and are denominated "the pulse:" without the contractions of the heart there can be no pulse, and the conditions of the artery plainly speak of the state of that organ and general circulation. The arteries in all parts of the body afford similar evidences, but those far removed, as in the limbs, do not as a rule expand immediately on the contraction of the heart, as in larger trunks, and those nearer to that organ. A perceptible time elapses, and the impulse is also somewhat diminished. There is no pulse in the veins, except in an instance about to be named. After the blood has passed through the capillaries, the current is equalized by obstructions of various kinds, the pulse is lost, and returns by the veins in a steady uninterrupted flow.

The pulse is conveniently felt at the jaw. At this part the submaxillary artery comes from the inside, and winding along, passes over the lower edge of the bone, and mounts upwards on the side of the face, in front of the large flat muscle which closes the jaws. Here the artery of the left side is felt by means of the first and second fingers of the right hand, which are pressed upon it towards the inner side of the bone, while the thumb is placed outside, in order to maintain steady pressure. The artery of the right side may be also conveniently examined. For this purpose the examiner stands on the left side of the animal, and holds the horn with the left hand; the right is then passed over the neck to reach the jaw, the fingers and thumb being placed as just described. Sometimes the animal is masticating, when the pulse must be examined at another part. The brachial artery may be felt at a point on the inside of the forearm, below the shoulder, and nearly on a

level with the elbow-joint, but in advance of it. A little practice is required to detect the vessel at this part, but if the situation of the joint is noticed, and the vertical ridge of the arm-bone (radius) is selected as a centre, the fingers need not wander far in order to discover the pulse.

Other parts also conveniently offer the means of examining the pulse, as the fetlock-joint, where the metacarpal arteries are present, which enables the practitioner to examine the state of the circulation when cattle are lying without disturbing them, as one foot is generally found to be extended. The facial artery may also be found, a little higher than the point at which the submaxillary artery is felt at the jaw, below the eye, and behind the angle of the mouth. In some cases it is necessary for the practitioner to pass his hand up the rectum—*anus* or *fundament*—in order to examine the condition of the large abdominal and iliac arteries. Differences of calibre and obstructions to the flow of blood are significant tokens of serious damage to the hind parts.

It is not necessary to exert a great amount of pressure upon the pulse. When two fingers are employed, the artery should be included in the hollow that exists between them when held together. The possibility and tendency to roll away from observation is thus lessened. Pressure should be moderate and well regulated, and the impulse is then communicated with precision and certainty.

The number of pulsations in health vary in different animals. In cattle the artery feels firm and tense beneath the finger, and the pulsations are tolerably soft and equal, with a greater duration than in the horse. In the sheep there are signs of greater activity in the beats, while the calibre of the artery is smaller and wiry. In pigs the pulse is hard and possesses little elasticity. The careful observer will also notice that, in addition to the characteristic differences that obtain in the pulse of each animal, the process of respiration suffers modifications;

formation and other peculiarities having much to do with their production.

The circulation is most active in young animals ; at middle age it is lower, and lowest of all in old age. From various observations we are enabled to state the number of pulsations in the different animals to be as follows :

	Young Animals.	Adults.	Old Animals.
Cattle.....	55 to 65	45 to 50	40 to 45
Sheep.....	80 to 90	70 to 80	55 to 60
Pigs	100 to 110	70 to 80	55 to 60

The pulse is influenced in health by various conditions, for which very careful allowances have to be made when appealing to it as an aid to the investigation of disease. *Temperament* exerts evident effects upon the circulation. This must be admitted without reservation when is considered the fact that the heart and all the blood-vessels are under the perfect control of the nervous system. Any particular condition, therefore, attaching to the brain and spinal cord influences the flow of blood. This will be singularly apparent on examination of the pulse of two animals, one a thoroughbred horse, the other one of a heavy breed. In the former the artery will appear to bound beneath the finger, while the calibre is large and resistance proportionately great ; but in the latter the artery is soft and the beats slower, and in many cases are only felt indistinctly.

The *size* of animals also ensures a modification of the pulse. All small ponies exhibit an accelerated circulation ; but the differences are not so remarkable as they have been stated by writers.

Heat and want of proper ventilation have great influence upon the animal body : the arteries are relaxed, action of the heart quickened, and the pulse frequently reaches ten and even upwards of twenty beats above the acknowledged standard. This fact alone, securing as it does an increased amount of wear and tear of the system, besides creating an undue sus-

ceptibility to disease, should arouse many of the large dairy proprietors in town and country to increased vigilance, and desire to adopt proper means for securing greater comforts to the inmates.—*Ed.*]

THE PULSE IN DISEASE.

[The pulse is materially influenced by disease, modifications being the result of vital, physical, and mechanical causes. The evidences are made known in frequency and alterations of strength and regularity. Different terms are employed to denote the various kinds of pulse, the principal of which are :

1. As regards the number of pulsations in a minute, the terms *frequent* or *infrequent* are given. By frequency is implied *rapidity*. The pulse is said to be frequent or rapid when the beats, without regard to other characters, are accelerated, and consequently above the normal standard. The infrequent pulse, on the contrary, may number as many beats as the normal pulse, but usually is below it.

2. In reference to the *nature* of the pulsation as afforded by an estimate of the length of time occupied by each beat, without any reference to the time existing between them, the terms *slow* or *tardy* and *quick* are employed. The contraction of the heart is prolonged, and, in consequence, the expansion of the artery is of longer duration. The origin and termination of the beat is plainly evident to the finger, and the pulse is then denominated *slow* or *tardy*, a common result of affections of the brain. The term “quick” is too often confounded with and substituted for the word “frequent,” an error which is fatal to all description, and has proved more so to the animals to which it bore reference.

3. In proportion to the amount of dilatation or expansion of the artery, in length as well as diameter, the pulse assumes the character of being *large* or *full* and *small*.

4th, and lastly. With reference to the effects of pressure on

the arterial tube, the degrees of compressibility favour the employment of the terms *hard* and *soft*.

The characters of the pulse are not always to be observed alone and in the order given; they frequently exist in combination, when terms of a compound nature are made use of to express the state. Thus we speak of a pulse being "full or large, hard, and frequent," or "full, soft, and slow," "full, soft, and tardy," "small, hard, and frequent," &c., &c. Such combinations of the original titles, with many others that are suggested to the veterinary practitioner in his daily observations, are ample for accurate description. Hitherto we have been fettered with too many terms, which, it is to be feared, have ministered to perplexity rather than to clearness and facility.

In certain diseases the pulsations exhibit great variations with respect to each other as well as to the time. A few beats succeed others very rapidly, their strength is unequal, and the time between each not the same; then comes a pause of greater or less duration; beats again succeed each other as before, and are followed by another variable pause. This is known as an *irregular* pulse.

Under other circumstances the pulsations continue with regularity but greater frequency, when suddenly the beating ceases. Such a pause may occupy as much time as three or four beats, and at the termination the pulsations are resumed with their former regularity. This is the *intermittent* pulse.

When disease continues to affect the system and weakness increases, the pulse becomes smaller, more frequent, and, after being indistinct, is altogether imperceptible, when death speedily ensues. Such a pulse is known as the *running down* variety. When, however, disease declines in severity and all the concomitant signs disappear, the pulse acquires strength and volume, and is then said to be a *rising* pulse.

We must impress upon the minds of our readers the great need of becoming acquainted with the special characters of the

pulse in disease, if success is desired in the treatment of the affections of the lower animals. Too little attention has been paid to the subject, and the system of bleeding, as well as administration of medicines, has indiscriminately increased in consequence. The pulse, although a silent monitor, yet speaks with a wonderful power, and claims to be authentic in all cases of diseased action. To disregard its teachings and warnings is equal to dealing with the animal body as if it were an inanimate machine. To understand them would be tantamount to the saving of thousands of animals and millions of pounds throughout the British Isles.—*Ed.*]

VENOUS PULSE.

[The phenomenon described as a venous pulse is observed in the jugular veins upon each side of the neck. It has long been regarded as an inevitable sign of disease, and the error even perpetuated by those who should teach more accurate theorems. The same authorities have also declared it to consist of a "regurgitation" within the jugular veins, which but a cursory examination would have dispelled. It is well known the direction of these vessels, being from above downwards, greatly favours the descent of blood towards the heart. The impulse is, therefore, greater than probably in any other vein, and its effects must be exerted upon some part of the surrounding tissues in the event of an obstruction being brought to bear upon the flow. If the fingers are tightly pressed upon the jugular vein of one side, the vessel will be observed to fill gradually. When fully charged, imitate a tilting action with the fingers that are stopping the flow, and the whole column will be seen to move even as far upwards as the jaws. If the veins are carefully watched when a horse or cow is grazing, the characters of the venous pulse will be seen in all their force, from which those who regard the phenomenon as a result of

disease, and neglect the physiological as well as anatomical peculiarities, may experience alarm and predicate wonderful appearances upon a *post mortem* examination. When an ox or cow is lying quietly in the pasture ruminating, the same effects are to be observed as a result of pressure upon the circulatory organs. The action of the carotid artery, which runs in company with the jugular vein, doubtless influences the latter, and during its pulsations momentarily *retards* the flow in the vein. An abrupt or imperfect closure of the tricuspid valves in the right auriculo-ventricular opening of the heart also exerts a similar effect; the result, therefore, is the same: the weight of the column of blood above being exerted upon the walls of the vein, causing them to expand and vibrate, develops the appearances so frequently confounded with diseased action.

There are, however, instances in which disease exists in the heart and large vessels that convey blood from it, together with emphysema of the lungs, in which the blood circulates through those organs with great sluggishness, the venous pulse is characteristic as well as continuous. To associate the venous pulse with inevitable disease, when no other signs are present, and to regard it as a reflux of blood, is to promulgate an error and obstruct observation. In this, as in other matters, too much has been accepted while investigation was ignored.—*Ed.*]

FEVER.

SIMPLE OR COMMON FEVER.

[This is a condition the existence of which has been denied. There are, however, ample signs which the intelligent observer will discover, if he devotes attention to a number of animals, which indicate beyond all doubt that a state of fever, palpably of a simple nature, frequently exists among them.

Nature and definition.—Simple fever must not be regarded in the too common light, as in many others, that some potent influence is at work, and extensive disease of important organs is going on. It is purely of a transient character—a disturbance *per se*, and has been emphatically named *ephemeral fever*. The term “fever” is so generally associated with protracted or severe diseases, that alarm usually accompanies its utterance, and this may probably have had much to do with the cultivation of a growing dislike for the term.

Simple or ephemeral fever is common to man and all animals as an independent affection. It may be defined as a general disturbance of circulation and the functions of the body, without the evidence or existence of disease, and as such may be known to account for signs that appear among cattle and sheep, &c., and too frequently neglected until they assume another character.

Causes.—Inactivity, combined with a highly nutritious and stimulating food, heated atmosphere in crowded and ill-ventilated buildings, &c., a peculiar idiosyncrasy or habit of body which causes the system to become more sensible of the influence of the causes named; lastly, long journeys by road and rail, without due regard to food and comfort. Any or all of these, exerting their effects upon the nervous system and circulation, accelerate the assimilative functions by which increased temperature is produced. An accelerated circulation in the skin will probably arrest exhalation, and temperature is promoted. Other functions are similarly disturbed, and secretions checked or diverted. Such give rise to the following

Symptoms.—The pulse is frequent, and somewhat larger and harder than in health. The ears, horns, extremities, and skin generally, are warmer than natural. The mouth is hot and sometimes partially dry. Membranes of the nose and eyes somewhat higher in colour. The urine is deficient, skin dry, and probably harsh, bowels are costive, and the thermometer

placed in the rectum registers 102° F. or 103° F. There are no other appearances of disorder to the ordinary observer, and even these may escape attention. Sometimes the animals are thirsty and reject a meal, but when the attendant visits them the next morning all these signs have disappeared. A change from roots to a dry diet, or *vice versa*, may produce common fever, and likewise a journey by road, undertaken after weeks of confinement, exposure to a hot sun, change of habitation when differences exist in points of comfort, &c., &c.

Treatment must be pursued in accordance with the cause. Where irregularities exist as to feeding, housing, &c., or excesses occur in domestic treatment of any kind, they should be mitigated and improvements instituted. If a moist and heated atmosphere is the cause, a careful sponging of the body with cold water will suffice to bring about a balance of function. Linseed-tea and bran mashes, grass, clover, roots, &c., are necessary during constipation. Medicine is not always called for, the diet above named will generally be sufficient. If, however, the signs continue, and causes are not sufficiently apparent, the system may be relieved by a draught composed of the following :

RECIPE NO. 1.

Take of sulphate of magnesia (Epsom salts), or sulphate	
of potass	2 oz.
Powdered ginger	2 drs.

Mix and dissolve in a pint and a half of tepid water, when it may be administered. The dose may be repeated in twelve hours if necessary. Half the above quantities may be given to a calf or sheep. It may be advisable to throw up an enema or clyster of tepid soap and water. This remedy is simple, and effective under many circumstances, and in the disorder alluded to is likely to supersede agents of a more active kind.

When simple fever occurs after continued exertion, as long journeys by road and rail, there may be noticed general relaxa-

Sympathetic or Symptomatic Fever. 19

tion of the whole muscular system. The limbs are mobile and the flesh soft and flaccid; the animal declines to be roused, and lies continuously; and in addition to the signs already detailed, the pulse is frequent, small, and weak, flatus is discharged from the anus in an involuntary manner, while the muscle guarding the opening is dilated, and often insensible to stimulus. Under these circumstances great prostration is evident, and must be met by diffusible stimulants. There is want of tone in the whole circulation and blood-vessels, and the nervous system is depressed. Local congestions are likely to occur from repeated attacks, organs become weaker, structural changes take place, and the foundation is laid for fatal or chronic disease by neglect of the conditions.

In cases of emergency, stimulants, as ale, porter, brandy, or best of all, whisky, may be given, a pint and a half of the former or half a pint of the latter in water, to which three or four teaspoonfuls of ginger may be added. The veterinary practitioner, however, will resort to more appropriate remedies, as sulphuric ether, aromatic spirits of ammonia, in half or one-ounce doses, as the requirements of the case are presented.

It must be borne in mind that when cattle are driven long distances, and the conditions above noted have been produced, they are not in a safe condition for slaughter. Although nothing more than a slight congestion of the lungs may have resulted, and no other structural change is present, the blood may have assumed a poisonous condition, and the flesh partaking of similar properties is unwholesome. Such animals should receive proper treatment, and allowed a corresponding period for recruiting their strength, when after a few days the flesh becomes perfectly safe as an article of human food.—*Ed.*]

SYMPATHETIC OR SYMPTOMATIC FEVER.

[To an ordinary observer the conditions under this and the preceding affection are apparently analogous, and close atten-

tion and examination of surrounding agencies are required in order to pronounce correctly in the earlier stages. The important distinction is the *persistence* of the signs. They are also liable to aggravation in proportion to their duration. An ox or cow with trivial signs of disturbance consumes the evening meal, and nothing is thought of a hot mouth, &c. ; but next morning the creature is labouring under acute suffering.

Symptoms.—These are as already detailed under “Simple Fever,” with the addition of intensity arising from special causes and morbid conditions.

Nature and Causes.—Sympathetic or symptomatic fever, as its name implies, is a morbid condition of the blood, favouring local congestions—of the lungs primarily—or disease symptomatic or characteristic, *i.e.*, dependent upon another or second disease. Thus an ox, cow, or sheep receives a puncture in some important part, as the foot, abdomen, lungs, &c., a leg is fractured, or some disease of the lungs or bowels arise, and in addition to the symptoms that are present denoting them, those of fever are present, and are said to be in sympathy with, or symptomatic of, such affections. Symptomatic fever, then, always exists *pari passu* in company with other diseases ; it is a sign by which their presence is detected and intensity estimated ; and while it may awaken a sense of alarm, it calls for prompt and well-directed measures.

Treatment.—In the absence of authentic information as to the cause and existence of contemporaneous affections, treatment is not likely to prove successful, as it cannot consist of any measures but those already advised for simple fever. The exact cause must be clearly made out, and special treatment instituted, details of which will be found under the respective heads.—*Ed.*]

INFLAMMATION.

[Every part of the body known as organized material—*i.e.*, having special sources of nutrition and nervous sensation, &c., as determined by the presence of blood-vessels and nerves within their substance—are liable to the process known as “inflammation.” Hoof, horns, hair, teeth, feathers, wool, down, claws, nails, &c., are excluded from this category. They are nerveless and bloodless. They are *organic products*, but *not organized* structures.

Nature and definition.—This is a point that has perplexed many, and opinions are not at all unanimous with reference to it. By some it is regarded as a result of plethora or excess of blood, while others regard it as an effect of morbid depression leading to a local accumulation. It is only by a comprehensive acquaintance with the laws of physiology that we can arrive at a satisfactory conclusion as to the nature of inflammation. It would also be impossible to discuss the point at length here, but sufficient for all practical purposes, and consistent with the object we have in view, will be gathered from the following remarks.

By a reference to the illustration and description given at page 8, it will be observed that in circulating blood the central line of the current is composed of red globules or blood discs, moving freely upon and over each other. There is no disposition to assume awkward shapes and block up the vessels; on the contrary, they are perfectly elastic, and with the utmost willingness become wider or longer, or are pressed into much smaller compass to enter a smaller vessel. The influence of living tissues, as derived from the nervous system, appears most probably a predominant and essential condition; but when from any cause that influence is withdrawn, the order, precision, and certainty of the flow is disturbed or totally

arrested. The blood-vessels relax and no longer maintain their controlling power. The blood globules have lost their disposition to flow on harmoniously under all conditions, regardless alike of pressure from behind or from each other, size of vessels, or the peculiarities of shape their neighbours choose to assume. They now throw aside the discoidal or circular form peculiar to man and the higher animals, become

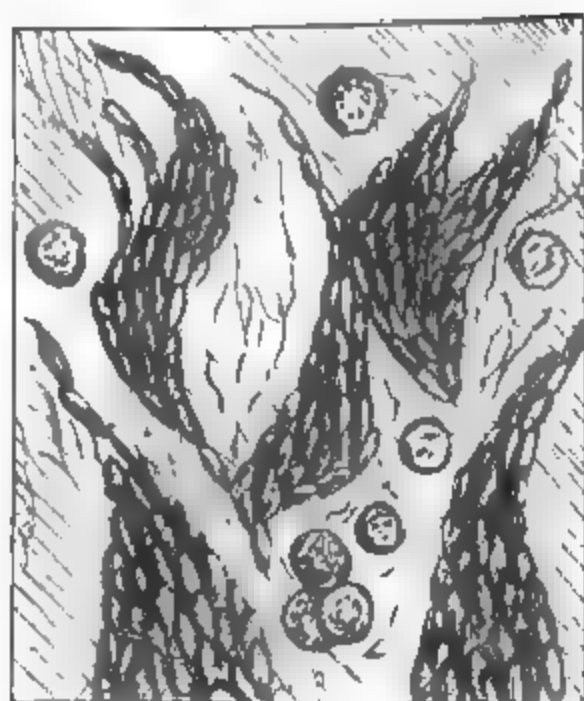


FIG 3.—*Blood in a state of Inflammation.*
The appearances presented under the microscope.

elongated, attract each other, and resolve to assist in a general obstruction. Their sides present surfaces by which they adhere to each other or to the walls of the vessels, and the appearances presented are after the form given in Fig. 3.

Inflammation, from whatever cause, is essentially the same. Neither does locality or nature of tissue bring about any specific kind of inflammation. The *effects* or *results* of the process, however, may be various.

The constituents of the blood also undergo an alteration during the inflammatory process. This is particularly noticed in reference to fibrine and red and white corpuscles. Doubt-

less the influence exerted by the original cause of the inflammatory attack upon the nervous system has much to do with the augmentation that has been noticed in accelerating the assimilative process, as we find that an increased general temperature (the result of an augmented combustion) is always present. Blood drawn from patients suffering from extensive inflammation has, therefore, a peculiar property of firmly coagulating. The contraction is also greater than in health, and this causes the whole to separate into two unequal parts, the solid portion being in excess of the fluid. In addition, also, from excess, the solid parts, particularly fibrine, assume a *buffy* appearance upon the upper surface, which is somewhat *cupped* or hollow—conditions pre-eminently due to the power and amount of contractility which the mass possesses; descent being greatest in the centre of the vessel, while adherence to the sides retards contraction, and that part of the mass descends the least. The cupped appearance of coagulated blood is closely represented by solid fats that have been melted and poured into earthen vessels. If the surface is examined when the mass has cooled, it will be found to be lowest in the centre, but highest round the edges, or at the inner circumference of the vessel, where the surface of the walls present greater attraction than occurs at the centre.

The *buffy coat*, then, is the yellowish colour presented by an unusual amount of fibrine, and the cupped appearance also of the upper surface is due to the same cause, which involves a firmer coagulation than in a usually healthy condition. These states are looked upon by the uninitiated as infallible evidences of inflammation, and many erroneous steps in practice are fostered and justified by the belief. Other conditions besides disease, we now are well assured, give rise to similar states, and, unless they are accompanied by additional signs, really prove nothing of an alarming character.

Inflammation, as regards its position, is of two kinds, viz.,

local and *general* or *diffuse*. In the first we recognize the action as being confined to the blood-vessels of one particular and small part of the animal body; the second is understood to comprise acute febrile action, the result of inflammation in large and important organs, as the bowels, womb, &c., including, of course, also the process within the latter.

As regards character, inflammation is also regarded under two aspects: *acute* or *sthenic* and *chronic* or *asthenic*. In the former we observe the tendency to progress with great activity and vigour; the nature of soft parts, as muscle, &c., from its elaborate organization, being eminently favourable to the process. Chronic or asthenic inflammation, on the other hand, is slow and tardy, by which much destruction of tissue invariably occurs, and reparation of the parts is attended with difficulty, and sometimes rendered impossible.

Inflammation as to kind is also known under various subordinate terms; thus, the rheumatic or scrofulous forms, &c., &c., are known as *specific*; when only the ordinary phenomena are observed, it is called *common*; when the disposition is locally to form tumours and abscesses, the term *phlegmonous* is applied; while another form having no such tendency, but affecting the skin and subjacent tissues, is known as *erysipelatous* inflammation.

Symptoms of Inflammation.—The physical appearances of inflammation are *heat*, *pain*, *redness*, and *swelling* or tumefaction. These are for the most part less easily demonstrated in the lower animals than in man. A few brief remarks on the several heads are necessary.

Heat.—Of the various signs that wait upon the process of inflammation, probably none are as remarkable as heat—animal temperature. It makes little difference whether the morbid action is local or general, it is always accompanied by an elevation of temperature in the part, and in nearly every instance also by similar evidences throughout the system. The source

of increased heat in these cases is exactly the same as under healthy conditions of the system, the process being accelerated *generally* by influence upon the assimilative functions through the nervous system, and *locally* by the same process, as well as an increased quantity of blood being *in* the part—increase or activity of assimilation and the presence of blood material being, as already explained, productive of animal heat. During inflammatory action of an extensive character the thermometer proves a safe guide to the *amount* or *intensity* of the same, which is demonstrated by placing it upon the part if externally situated, or within the rectum in general cases.*

Pain is the result of pressure. Under the effects of an increased quantity of blood in the part, blood-vessels are distended, and the nerves, already acutely sensitive through the influences of a morbid character, are suffering from that pressure. The sensation becomes doubly acute, as is evident upon the slightest touch in some animals, and continues until the morbid process is terminated. Others, however, bear pain with comparative heedlessness.

Redness.—From the great amount of covering found upon most parts of the animal body, an increase of colour is not always visible. In general inflammation, however, the membranes of the eyes, nose, mouth, and vagina—hereafter called the *visible mucous membranes*—exhibit the character to the fullest extent, and which is taken as a very close approximation of what is actually going on within. The hue spoken of is that of which the blood partakes when viewed in a mass. During the distension of blood-vessels under inflammation, the increased quantity they contain is plainly visible through the walls, that have become thin and transparent from stretching and internal pressure. Redness of inflammation is, then, the colour of the blood as seen through semi-transparent membranes that form the affected tissues.

* *Op. cit.*

Swelling.—This phenomenon is not always observed : when internal organs are affected it is impossible, except under few conditions, and when situated locally it may be altogether hidden by the nature of the part affected or the covering that it possesses. Thus when ligament, tendon, or bone is involved, swelling is rarely noticed at the time ; and when the feet are suffering from inflammation, the hoofs effectually bind down the internal structures, and prevent our observing it. Whenever it can be detected, swelling is a most incontrovertible sign, and pregnant with evidence of a most useful character.

The nature as well as cause of the swelling consequent upon inflammation has formed, in times gone by, a subject of as much controversy as that of inflammation itself. Swelling was at one time thought to be due to distension merely of the blood-vessels. Later it was found that a great quantity of *lymph*—another term for fibrine—always existed in the neighbourhood of inflamed spots, and the cause as well as nature of the swelling was then decided. As to the origin of the fibrine, all are not agreed. One teaches that it is a result of distension of the blood-vessels, in which their stretched walls were thought to favour the exudation or passage of lymph outwards.

It must be known, however, that throughout the body are distributed a series of vessels called *lymphatics*, or lymph-vessels, whose office is to take up and convey to proper receptacles—the circulation generally—that substance known as fibrine, the origin of which is assigned to the capillaries or hair-like tubes. During inflammation the formation of this substance is, as already stated, unusually active, particularly in and around the inflamed structures. At that time, however, the vessels (the office of which is to collect the fibrine) are incapacitated by reason of the morbid process referred to, therefore accumulation takes place, and forms the enlargement under consideration, known as the swelling of inflammation.

The presence of lymph is characteristic of inflammation,

and by it tissues are thickened—signs that should not be overlooked in judging of internal organs when affected. Congestion, extravasation, ecchymosis, &c., are frequently mistaken for true inflammation—a most unpardonable error, but quite common among pretenders. If agriculturists, as a body, would resolve to obtain reliable information upon these points, they might arrive at better judgment of the capabilities of those they now in many cases employ as veterinarians. Quackery and empiricism would be at a discount, and then might be estimated the losses, incurred almost daily, by suffering uneducated men to assume the medical charge of their cattle—men who practise a system of chicanery and fraud by pretensions to matters regarding which they have even less opportunity of knowing anything than the agriculturists themselves.

It is notorious that educated proprietors will tolerate the grossest amount of deceit and irregularity among the attendants of their stock—the great source of their wealth ; while a trivial inaccuracy in a banking account, that may have resulted from a venial fault, would be visited with the severest censure or loss of position. By such preference, a premium is put upon ignorance and empiricism, while zealous and educated practitioners wait years for profitable employment, or are compelled to seek out a fresh sphere, after suffering, among many privations, almost that of starvation itself.

Causes of Inflammation.—It is most unquestionable that the agency of the nervous system is the main instrument by which tissues derive that complex principle called life—the circulation of the blood controlled and preserved in harmony and obedience to general as well as special laws. We therefore observe as a natural sequence, that all forces, actions, or agencies that interfere with, disturb, or destroy the harmony of nature in the animal body, do so through the nervous system ; and, as far as they are productive of inflammation, are regarded as causes. For the sake of conferring distinctive characters, they may be

called *mechanical*, *chemical*, and *vital*. Doubtless each produces inflammation by the same principles, but under a variety of operation, *i.e.*, by their effects upon the nervous system. Thus, mechanical irritants, as blows, friction, pressure, cuts, tears, falls, &c., &c., destroy nervous power in some particular part, and the result is that, by its withdrawal, those living tissues become as dead animal matter. Blood can no longer circulate through tubes of such character, nor with any different result than if a tube of lead or India-rubber, &c., were substituted. When chemical agents, as strong acids, the hot iron, &c., are employed, tissue is chemically destroyed or devitalized, and the same results are brought about ; and in the more complex causes, termed vital, we must recognize the same effects, but refrain from broad and decisive statements as to their *modus operandi*. Thus cold, we may know, depresses and destroys the tone of nervous action ; powerful poisons may do the same ; want of pure air induces peculiar conditions, usually described in one word—asphyxia. By the senses the influences at work may be accepted and even understood, but words hitherto have failed to penetrate the labyrinth, and decide in a plain form by what means they produce their effects. Life may be viewed as a collection of harmonious functions working with and for each other ; and proportionate to the disturbance or arrest placed upon them, certain effects are demonstrable. One of these is inflammation, local, and, it may be, slight, or it may be general or diffuse—so extensive, that the whole functions are destroyed, and life can no longer remain. Both are processes essentially the same ; the results, however, are in proportion to the disturbance.

Termination of Inflammation.—The results of inflammation are variously described as *Resolution*, *Effusion*, *Suppuration*, *Ulceration*, *Interstitial Deposition*, and *Mortification*.

Resolution is understood to be a gradual decline of inflammation within the affected part, followed by a restoration to

original health and condition. Thus an eye is inflamed in consequence of a blow or entrance of a foreign body, but after proper measures are instituted, the active signs, as heat, pain, and intolerance of light, disappear, and the organ is as useful as before.

By *Effusion* we comprehend the accumulation of large quantities of fluid (serum) within closed cavities, as the abdomen, chest, and even beneath the skin, the common result of turgid vessels, the walls of which are stretched, and admit of the passage of the thin or watery parts of blood to pass outwards.

Suppuration is the removal of the solid products of inflammation by change of constitution, the result being a creamy-looking fluid termed *pus* or *matter*. Membranes which have suffered from inflammation discharge pus from their external surfaces; but when the substance of glands, muscles, organs, &c., are seized by the process, the accumulation of pus takes place in the centre of the mass of inflammatory products (lymph, before spoken of), and this we term an *abscess*.

Ulceration may be defined as the loss of substance at a particular part, occasioned by inflammation at the circumference cutting off nutrition. Such a condition is pronounced *unhealthy*, and is so far correct, that when parts of the body have been frequently subjected to the process of inflammation, or the system has suffered from devitalizing influences, circulation is arrested or undergoing inflammation around a former abscess, nutrition, in the form of pure blood, fails to reach the inner part, and no reparation takes place; on the contrary, the effect is to reduce by solution the tissues, which are removed in the form of a thin sanious discharge. *Sloughing* is an extension of the process, by which whole masses are detached without undergoing slow removal or solution.

Interstitial Deposition is the augmentation of substance within tissues as a result of inflammation. This addition, however, is not of the nature of the tissue in which it has been placed;

thus, when muscles have been torn asunder, the lost substance is replaced by an unyielding and insensible, non-contractile material called condensed tissue. The muscle has, therefore, lost its power of action, more or less. When the substance of the lungs has been inflamed, the products obliterate the air-cells, and the substance assumes a state called hepatization; and when the outer surfaces inflame, they unite to the sides of the chest; the lymph of inflammation being the medium whereby both are produced. When the liver is inflamed, the same lymph takes the place of the bile-cells, and the partitions or *septæ* of the organ enlarge by the addition; the state is then known as *schirrous* or *induration*.

Mortification.—This a term that implies death of a part. It is an example of sloughing on the most extensive scale; while the former is applied to the removal of parts from within other parts. Mortification denotes the cutting off from circulation and nutrition of whole parts or limbs. Whenever the blood-vessels going to a part are destroyed, or the flow of blood is effectually prevented, that part dies, and separation is effected at the point where nutrition is first cut off.

Treatment of Inflammation.—The methods employed are regulated in accordance with the form presented. *Local inflammation*, presenting comparatively feeble powers of resistance, usually retires before ordinary remedies, as cold or evaporating lotions. The object of such is to restore the tone or contractile power of the vessels, and induce a return of the circulation. With such a result the necessary signs, as heat, pain, redness, and swelling disappear, and resolution is said to take place. Cooling and evaporating lotions are thus constituted:

RECIPE NO. 2.

Take of Goulard's Extract	4 fluid oz.
Dilute acetic acid	2 „
Distilled water	1 qt.

Mix together. The parts to be surrounded by a linen bandage and kept continually wet with the mixture ; or it may be applied by means of a sponge or soft rag if the bandage is inapplicable.

RECIPE NO. 3.

Take of muriate of ammonia.....	1 oz.
Muriatic acid (pure)	2 drs.
Water	1 pt.

Mix and apply as already directed.

RECIPE NO. 4.

Take of muriate of ammonia, powdered	1 oz.
Dilute acetic acid	4 „
Spirits of wine	4 „
Water	1 pt.

Dissolve the ammonia in the acetic acid ; then add the spirits and water, and use immediately as an ablution to the part.

RECIPE NO. 5.

Take of muriate of ammonia, powdered	2 oz
Nitrate of potash, powdered	2 „
Spirits of wine	8 „
Water	1 qt.

Mix the spirits and water together, and add rapidly the powdered salts. The parts are then to be bathed *incessantly* as long as the quantity of lotion lasts, or the necessity of the case requires.

RECIPE NO. 6.

Take of solution of the acetate of ammonia, and spirits of wine, of each	4 oz.
Water	1 pt.

Mix, and apply as an ablution, or by means of a linen bandage surrounding the part.

The disadvantage attending cold applications, if their use is not incessant, is that of “making matters much worse.” Their first effect is to constrict the vessels and reduce the quantity of blood within them ; but if such be not continued, the

secondary result is that of *reaction*, in which the vessels dilate, and then accommodate an increased quantity of blood. The disease is thus aggravated instead of being lessened. Cold applications are most suited to sprains of ligament and tendon.

When cold applications cannot be maintained, much good may result from *fomentations*. But even these must be persistent. No benefit can possibly accrue from the *periodical* use of hot or cold applications if the effect they produce is not kept up. Reaction sets in as much after the effects of heat as of cold; therefore, when a fomentation is needed, the temperature of the water should be constant, and the application and supply unremitting. The following particulars should be carried out in a scrupulous manner.

If the affected parts are large, arrangements should be made for an extensive supply of hot water. A few rugs, &c., may be thrown over the former in the meantime. The animal being conveniently placed, one man undertakes the sole duty of applying the remedy. This is to be done by placing over the affected parts, four, five, or six thicknesses of woollen, after being saturated in the water. The pail or tub containing the fluid is placed as near as possible, that water running from the rugs may fall into it. The operator is supplied with hot water in regular proportions, the temperature of which should be between 110° F. and 118° F.; and this he applies by means of a small tin bowl or earthenware cup, &c., at the top part of the rugs, in order that a continuous stream is caused to flow beneath the covering in connection with the skin. The time for such an application *will vary from one to six, eight, or ten hours, after which the parts must be well dried by cloths and friction if possible, and subsequently well protected from evaporation and inevitable cooling by thick dry coverings carefully adjusted.*

Poultices are sometimes required, and are especially serviceable in promoting suppuration and the formation of abscesses.

They may be composed of bran, linseed meal, or even fine sawdust may be used for the feet, the efficacy of each depending upon the power to maintain a constant and equal temperature—cold or hot—with moisture, as may be desired. The mode by which poultices are applied depends greatly upon the part affected. The feet and lower parts of the extremities are conveniently placed in bags, the mixture being afterwards packed around by the hands. Upper portions of the limbs are best enveloped in the leg of a worsted stocking, or stout case of calico, each of which must be wide enough to contain sufficient mixture, the outside being well covered by several turns of an ordinary bandage. To other parts the single and double many-tailed bandages (Figs 4 and 207) are of great service. Poultices, as commonly made and applied, are frequently very obstructive to the desired ends. When too large and heavy, great discomfort is produced in weakly animals; when applied beneath or to the side of parts affected, even slight motion and ordinary weight cause them to hang awry, and by admitting air between, rapid cooling ensues. Maturation of the abscess is thus retarded, and a chronic form of inflammation takes place. Severe constitutional irritation follows: the lungs may be implicated, or, in addition to the exquisite soreness of the original tumefaction, other swellings appear at various parts, exhibiting also uncertain progress, and not unfrequently proving fatal by subsequent discharge into some cavity or organ of the body. Under all circumstances the application of poultices should be effective and perfect; the temperature and moisture must be constantly maintained, and all such beastly concoctions as cow-dung, human excrement, &c.—the suggestions of filthy minds—scrupulously avoided if successful results are desired.

There is now manufactured a substance known as *Spongipiline*, being a sheet of waterproof material covered on one side by a thickness of wool. When this is cut to the proper

size, dipped in hot water and applied to the part, it retains the heat and moisture for a great length of time, besides being much lighter and more comfortable than an ordinary poultice. It may be secured in position by the common many-tailed bandage (Fig. 4) according to circumstances.

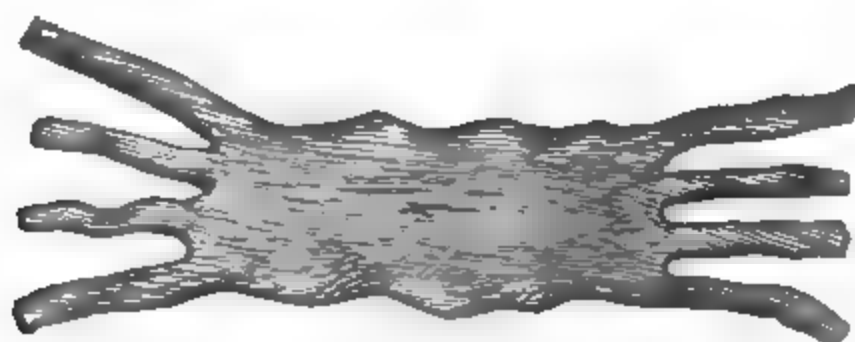


FIG. 4.—*Many-tailed Bandage.*

Take a stout piece of calico or pack-sheet, in length sufficient to encompass the parts one and a half times; the width must be formed in accordance with circumstances. At each end an equal number of slits must be cut, by which corresponding bands or tails will be formed. The central part is to hold the application, and the bands or tails are to be tied to each other after the whole is adjusted.

Counter-irritants.—These comprise *blisters*, *setons*, *rowels*, and the *actual cautery* or *firing-iron*. In cattle practice, the first and second are principally resorted to. The third are discarded as antiquated, unscientific, and barbarous. The last is seldom required.

Blisters are variously constituted, and are obtainable at the shops of all dealers in drugs. For ordinary purposes they are merely an admixture of powdered cantharides and lard; but other additions are made in accordance with special requirements of the case. A new vesicatory insect, the *Mylabris cichorii*, has been introduced of late years, and promises to answer many purposes, having superior properties to the old "blistering fly."

Such compounds are, however, almost useless in the ox. Pounds of cantharidine ointment might be rubbed upon the hides of cattle, and a blistering effect would be a novelty. To induce the desired action, therefore, additional ingredients of well-known power are compounded with the ordinary "fly blister" after the following forms :

RECIPE NO. 7.

Take of powdered cantharides.....	2 oz.
" euphorbium.....	1 "
Oil of turpentine.....	2 "
" origanum	1 "
Hog's lard	16 "

Put the whole in a water-bath, or what answers the purpose equally as well, a clean glue-kettle, such as is used by the carpenter. Let hot water be placed in the outer vessel, and the whole kept at a point a little below boiling for eight hours; then remove, and strain through a coarse cloth by means of pressure, and set aside to cool.

RECIPE NO. 8.

Take of tartar-emetic	1 oz.
Hog's lard.....	4 "

Mix on a marble slab by means of a spatula. Sufficient only for present use should be made, as the compound is liable to become inactive by chemical action.

RECIPE NO. 9.

Take of the tops and leaves of savin	1 oz.
Hog's lard.....	2 "

Mix and heat in water-bath, as in Recipe No. 7.

RECIPE NO. 10.

Take of croton seeds, bruised	1 oz.
Oil of turpentine	8 "

Mix and set aside fourteen days, frequently agitating the mixture ; afterwards filter for use.

The application of the foregoing remedies must be attended with smart friction, and a large surface should always be covered in order to secure the proper benefit from them. The proprietor, however, is warned that there is great danger to be apprehended at times from the setting in of an extreme inflammation of the skin, and subsequent sloughing. In the hands of inexperienced persons they prove sometimes sadly destructive to cattle, and therefore must be undertaken with care and consideration—or, what is better, under the supervision of a qualified veterinary surgeon. Active agents like these, applied in the form of an ointment, are also liable to be absorbed into the system, and produce all the signs of poisoning, when their application has been too extensive or continuous.

Blisters are eminently useful from their having the excellent property of *immediate action*, a great advantage when cattle are suffering from acute diseases. They should *never be applied during the first stages of severe constitutional affections*. It is only proper that the action and signs should first be allowed to subside, after which the full benefit of a blister will be more easily developed, and the effect one of more lasting good. Blisters should *not* be applied immediately upon a part contiguous to one undergoing acute inflammation if the object is to reduce it, but at some distance. If, however, at a local point the formation of pus is required, or a slowly-forming abscess is present, then the blister should be placed immediately upon the enlarged parts, and well rubbed in for some distance round it. When blistering ointments are used, the hair (if long) should be clipped off previously. Subsequent dressings consist of olive oil carefully applied by means of a soft brush, but its efficacy is considerably enhanced by an addition of Goulard's Extract, in the proportion of 2 oz. to 6 oz. of oil. The mixture is well shaken, when it forms a thick creamy fluid known as *lead liniment*.

Setons.—These consist of pieces of tape passed by the aid of a proper needle beneath the skin from one point to another, in order to set up an amount of irritation, or to drain off the contents of some cyst or abscess, &c.

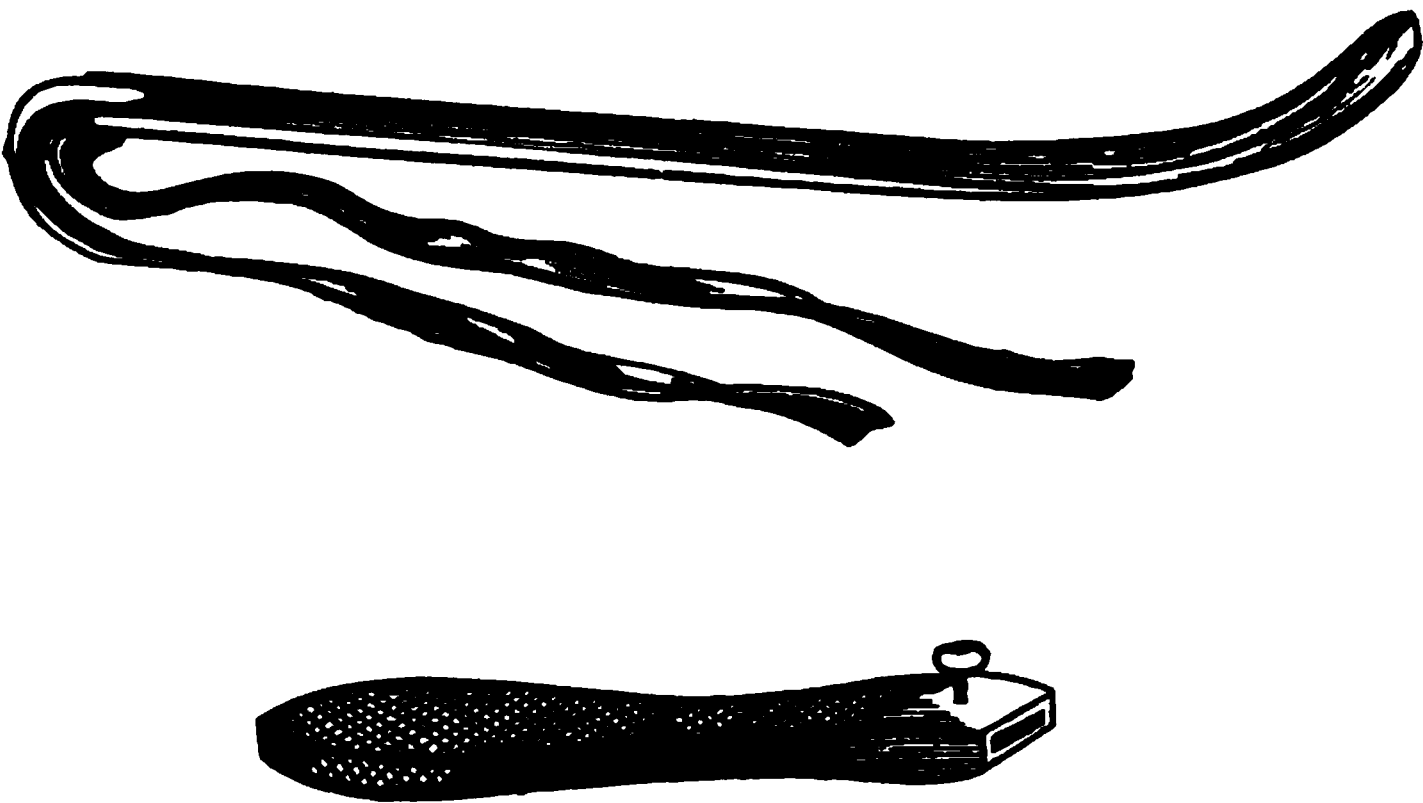


FIG. 5.—*Seton: Needle (armed with Tape) and Handle for use when force is required.*

In order to prevent the seton “working out” of the orifices, it is secured in two ways: one, as in Fig. 6—both ends of the tape being brought together and simply tied in a double knot; the second, as in Fig. 7—each end being secured to a piece of wood about 2 in. long, and hollowed in the centre with the blade of a pocket-knife. When animals are loose, the first form is apt to be caught by hooks, or other projecting bodies, and torn out. The second is generally secure against such an accident.

Setons are usually smeared with blister ointment after being inserted, in order to increase their irritant action. As a rule, they are very slow agents, and cannot take the place of a blister when activity and promptitude are required. Setons should be moved upwards and downwards each day, by which the discharge of matter may be increased and facilitated; a hot fomentation or washing daily with hot water is also fre-

quently advisable, as accumulations and useless irritation are prevented thereby.

The object for which counter-irritants are employed in the treatment of inflammation is an endeavour to establish



FIG. 6.



FIG. 7.

a similar action in a remote part, which shall overcome or destroy the pre-existing disease, by reason of greater intensity, and having characters that may be more effectually controlled. In addition, it is believed that two diseases of equal intensity cannot exist at the same time; and, further, when the healing action of external parts, after blisters or setons have been applied, is fully established, an equal and co-existing recovery takes place in the part originally diseased. It is a bad sign when blisters do not act or rise, and setons fail to produce a discharge. Disease is then understood to be intense, unmanageable, and fatal.

The successful treatment of inflammation by medicines is also, by similar means, that of a "derivative" character. Thus

sedatives are used to lower the heart's action ; *purgatives* to divert the flow of blood towards the intestines, by *diuretics* to the kidneys, and by *diaphoretics* to the skin ; besides special remedies whose action is confined to particular organs alone, or the blood, &c.

Further particulars will be given under the various heads as they appear throughout the work. Clysters, enemas, or injections, as they are variously termed, are also of great service in promoting the action of the bowels, and assisting that of purgatives. These also will be described in another part—the Appendix.—*Ed.*]

ABSTRACTION OF BLOOD.

[Bleeding, or as it is variously known as *venesection*, *phlebotomy*, &c., at one time constituted the only reputable remedy for inflammatory action. In the present day, however, it is deservedly replaced by other means, and resorted to only on rare occasions by the scientific veterinarian. The locality selected for the operation also formerly was as various as the diseases for which it was proposed, and scarcely a part of the body in an aged animal could be found that had not been selected and seized upon for puncture. Later experience has determined that, if blood-letting is necessary, it should be practised in the course of the jugular vein, by which a more abundant and rapid flow is obtained, and resulting depression of the heart's action, effects that are recognized as the *desiderata* or only means of good in the operation.

In the ox and cattle generally the jugular vein is large, and loosely situated beneath the skin and among tissues that are very mobile. It cannot, therefore, be secured by the hand alone with as much freedom as is done in the horse, neither can sufficient pressure be applied by those means. The practitioner resorts to the use of a cord, which he passes round the

base of the neck and secures it at the top in a running noose, which can be detached in an instant by pulling one of the free ends. When sufficient pressure is exerted, the vein will be



FIG. 8.—*Ox prepared for Bleeding.*

The place at which the vein is opened is indicated by the mark at the lower portion of the neck.

found to enlarge in length and breadth, and eventually assume the appearance of a large rope under the skin, as represented in Fig. 8.

The horns are held by an assistant, and as soon as the requisite conditions are established, the blade of the fleam is placed in line with the vein upon the skin at the spot indicated in the drawing, and being struck smartly, enters the vessel, and blood flows at once. A *large* fleam should always be employed, that the essential rapidity and abundance of flow may be secured, which, when accomplished, is arrested by removing the cord.



FIG. 9.—*Twisted Suture.*

The next step is to close the wound by the common twisted suture. This is done by passing a pin through the lips of the orifice, *in the skin only, and at the centre*, and winding round it soft twine or tow in the form of a figure 8, as given in the accompanying illustration.

There is a difficulty in causing pins to enter the strong skin of the ox, unless the points are specially prepared. This fact has induced many to adopt other means for the closing of

wounds, but which, it is to be feared, possess no advantage over the old method. The Editor having experienced this difficulty, succeeded in preparing materials in such a manner that leaves but little to be desired. The process consists of placing the point of a common pin into one of the triangular grooves formed in a contrivance called a "stake," as shown in Fig. 10,* and striking it with a hammer. It is then turned and struck



FIG. 10.—*Instrument for giving triangular points to Pins used in closing wounds after Bleeding, &c.*

several times, the face of the hammer producing one plane or face, while two others are formed by the sides of the groove. At the same time three *cutting* edges are produced, which exhibit a larger diameter than the pin itself, and now forms an instrument that will pass through the skin with the greatest ease.

After wounds have been closed, the points of the pins are cut off, by means of a pair of scissors having a notch cut in the blades, high up in the throat. This is a necessary proceeding in order to prevent the sutures being torn out. Some persons object to close the wound after blood-letting in cattle, urging that no bad consequences follow. This is a mistake: such do occur, although those individuals may not have observed them.—*Ed.*]

* Messrs. Arnold and Son, West Smithfield, have successfully carried out the directions supplied them by the Author in making this useful article.

SECTION II.
BLOOD DISEASES.

BLOOD DISEASES.

[UNDER this head we have to consider a number of diseases, the existence and peculiarity of which depend upon an altered condition of the blood, having its origin in various causes, and give rise to special local manifestations which form their distinguishing characters.

In brief review of the nature and functions of the circulating fluid, it will be apparent to the careful observer that, being the means by which all the impurities and foreign or hurtful bodies are principally collected and distributed to the various organs for separation and expulsion, any interference with the functions of depurating organs will go far to deteriorate the quality of the blood, by causing an accumulation of foreign matters within it. Such are not necessarily of a poisoned character, but their presence in undue quantity, even when partaking of the nature of blood materials, may prove conducive towards a state of blood disease. A deficiency of natural qualities, as caused by imperfect assimilation, digestion, &c., also brings about opposite effects, which may prove disease itself.

Again, the presence within the system of foreign materials, in the form of animal products, may induce some particular morbid action and disturbance which amounts to an actual poison, and signs, local as well as general, are soon manifest, together with certain specific characters; thus many blood

poisons give rise to products which are eliminated in various forms of eruption, confined to the mucous membranes, mucous surfaces, or both.

Some of these, also, are further distinguished by the power those products possess, in being capable of propagating essentially the same disease in an individual of the same species, and sometimes to others of a different class altogether. Another variety gives rise to peculiar eruptions; yet the products are not capable of establishing the same disease in animals of the same species, but putrid or septic fevers—another kind of blood poisoning—are common after inoculation. Lastly, certain blood poisons give rise to extensive disturbance of the nervous system, and produce death by interfering with its control of vegetative life.

Acknowledging these characteristics, we shall attempt a classification in the following order:

- I. *A.*—Blood diseases arising from an inordinate, impaired, or arrested function partaking of sporadic characters, viz., Plethora; Anæmia; Rheumatism; Uræmia; Apnoea in lambs and sheep; Phthisis Pulmonalis; Purpura Hæmorrhagica.
- B.*—Blood diseases arising from the above causes, but exhibiting enzoötic, and even septic characters, viz., Arthrites, or Joint-ill in lambs and calves; Asthenic Hæmaturia, or Red Water in cows; Malignant Catarrh; Malignant Sore Throat.
- II. Blood diseases of doubtful existence, and supposed to arise from an animal poison of unknown origin, viz., Measles, Scarlatina.
- III. Blood diseases arising from animal poisons having an indigenous origin, *non-contagious*, but capable of producing in other animals a fatal septic or putrid fever, and exhibiting enzoötic characters, viz.:

A.—Anthrax, or Carbuncular Fevers ; Carbuncular Erysipelas ; Splenic Apoplexy ; Braxy in sheep ; Gloss-Anthrax or Blain ; Hog Cholera.

B.—Anthracoid Affections ; Parturient Apoplexy ; After-pains in ewes ; Red Water in sheep and lambs ; Blood Disease or Navel-ill in lambs.

IV. Blood diseases arising from animal poisons of unknown origin, not indigenous to British soil, highly contagious, and producing by inoculation * the *same* diseases in other animals of the same species, and constituting the class—

A.—Epizoötic diseases, viz. :

Rinderpest, or Cattle Plague.

Epizoötic Pleuro-pneumonia.

Epizoötic Aphtha.

B.—Variolous Fevers partaking of the foregoing characters except in their being chiefly sporadic, but occasionally epizoötic, viz. :

Small-pox in sheep.

Cow-pox.

Chicken-pox.

—*Ed.*]

* There are grave reasons for claiming exception in this particular with respect to pleuro-pneumonia, a septic though not always fatal state being induced instead of the original type of disease.

I. A.—BLOOD DISEASES ARISING FROM AN
INORDINATE, IMPAIRED, OR ARREST
OF FUNCTION, viz. :

1. PLETHORA.
2. ANÆMIA.
3. RHEUMATISM.
4. URÆMIA.
5. APNŒA IN LAMBS AND SHEEP.
6. PHTHISIS PULMONALIS.
7. PURPURA HÆMORRHAGICA.

PLETHORA—EXCESS OF BLOOD.

[The condition recognized as a fullness or excess of blood among cattle and sheep is pregnant with very great mischief to the stock-owner and breeder. It is the beginning of many serious diseases, and frequently of rapid and fatal ones. When the nature and properties of food, as afforded by a knowledge of the sciences of chemistry and animal physiology, are more generally understood by the agriculturist, it will be further within his power to regulate the quality and quantity of diet his animals should receive. When these are coupled with botanical and geological facts, he may also understand other causes that induce plethora, and which reside in plants and character of soil, &c. But we may not even stop here; for what are the sciences that do not enter the lists which make up what we carelessly term agriculture and “farriery,” or “cattle doctoring”? We presume if many who now profess to do their duty in either calling were to satisfy themselves how much

knowledge is required in order to become efficient, they would feel rather ashamed of their position, and wonder how they have been able to live so long under such a delusion.

The richness, fulness, or excess of blood material is derived from food of which the animal partakes. Large supplies of oil-cake, meal, rich pastures, &c., coupled with inactivity, are the causes. The blood becoming charged, at length assumes the condition of suffering from a poisoned state; for, in addition to the accumulation referred to, the several functions of the body that should minister to blood purification become inactive also. They therefore remain as impediments to the removal of hurtful material.

Symptoms.—Rapid improvement of condition, as indicated by health and bloom, and even unusual general cheerfulness. Shortly, signs of simple fever appear and recur, but frequently attract no attention; at length, fever of a symptomatic kind ensues, and ere the lapse of many hours, the animal is either dead or suffering from some alarmingly acute disease. Under such circumstances, it is not improbable that poison is suspected and even declared, for when a *post mortem* examination is made, the appearances go far towards encouraging such an idea in untutored minds.

Medical treatment must be based in accordance with circumstances. Ordinary plethora may be combated by change of pasture, causing the animals “to work for their living” by placing them where grass is not so abundant. Those confined to the house should have a reduced and less stimulating diet, and small doses of Epsom or Glauber’s Salts given—say three or four ounces every six hours, until one or two pounds have been administered. The sulphate of potash may be used under similar circumstances, or nitre may be given in half-ounce doses three times a day for two days. When cases are not so urgent, the medicines may be divided over a week. Bleeding aggravates the causes of plethora. Greater good is to be derived

from a restricted and proper diet and well-selected medicines, or the use of the Roman bath.—*Ed.*]

ANÆMIA—DEFICIENCY OF BLOOD.

[When an animal suffers a continued loss of blood by slow hæmorrhage or repeated large bleedings inflicted at short intervals; when females under lactation yield excessive quantities of milk, by which the system is drained of its nutritious elements; when food is deficient or of inferior quality, and animals suffer from protracted debilitating affections, making little progress towards recovery, the condition is recognized as anæmia—the *bloodless state*. There is a great deficiency of the red corpuscles and also of other solid constituents of the blood. It is thin or watery in appearance, and to these properties is also added a deficient circulation. The vessels become overloaded and distended; their coats are stretched and the fluid passes through, giving rise to dropsical states—chronic and passive in character—not only in the cellular spaces beneath the skin and between muscles, &c., but in the serous cavities, *e.g.*, the chest, abdomen, scrotum, &c. Besides, peculiarly morbid and intractable congestion of the lungs is common, with syncope (*fainting*), colic, chorea (St. Vitus's dance), partial paralysis, and tuberculosis (consumption).

Anæmia frequently occurs in sheep after suffering from dysentery, and in other animals by the absurd system of using too much medicine in the treatment of diseases without proper supervision.

Symptoms.—Gradual but general wasting of the whole muscular system; visible mucous membranes, as those of the eyes, nose, and mouth, &c., are pale or white; the pulsations are very weak; calibre of the artery exceedingly small, and loud and unusual sounds are heard in the neighbourhood of the heart; there is great weakness and prostration, and the appe-

tite is deficient and capricious—*dysorexia* ; if the animal is caused to move rapidly, it becomes affected with giddiness—*vertigo* ; the breathing is conducted with extreme difficulty, and suffocation is threatened ; the bowels are irregular, and a gurgling or rumbling noise—*borborygmus*—is heard among them almost continually, while flatus passes largely from the anus or fundament ; when the animal walks, the legs cross each other, and sometimes become fixed in such a manner that he falls, being unable to extricate them.

Treatment.—This must be regulated entirely in accordance with the causes, which should be thoroughly investigated and decided in all cases. If anæmia has arisen from profuse or protracted hæmorrhage, the flow of blood should be stayed as soon as possible. Diarrhœa or dysentery, not dependent upon any constitutional disease, must be very cautiously arrested, for which the following draught will be found beneficial :

RECIPE NO. 11.

Take of chloroform	2 fluid drs.
Or chloric ether	$\frac{1}{2}$ oz. to 6 drs.
Tincture of opium	$\frac{1}{2}$ oz.
Ale or porter	1 pt.

Such a dose is sufficient for a moderate-sized cow, and may be repeated in twelve hours if the action of the bowels is not altered. When success follows the exhibition of the medicine, moderate doses of gentian and ginger should be given in warm ale night and morning ; and the food must be of a nutritious quality, easily digested, and supplied in small quantity at regular intervals. Hay-tea, gruel, barley-water, &c., for drink, will also be required, and the comfort of the animal must be further promoted by good beds, ventilation, and clothing, if required.

Protracted cases will call for more powerful remedies, and the exercise of skill and extreme care, for which a properly qualified veterinary surgeon is best able to advise. Simple

anæmia may present no difficulty, but complicated cases which exhibit to the uninitiated no difference from the slight form, are apt to be confounded with it. The latter is rarely cured, and only detected by negative examination.—*Ed.*]

RHEUMATISM (RHEUMATIC FEVER) OR THE JOINT FELON.

The word *Felon* is of frequent occurrence in the country: it is chiefly applied to diseases proceeding from cold, and is variously called as follows: *Cold Felon*, *Joint Felon*, and *Chine Felon*.

This is a disease of the joints, and chiefly affects milch cows and young cattle at the spring of the year. It is in general occasioned by the animals being kept in a state of poverty and starving during the winter, and being suddenly exposed in the spring to the inclemency of the north or north-easterly winds in some low situation.

[*Nature*.—A specific condition of the blood, or constitutional disturbance, in which the whole of the body sympathizes; but the local manifestations are confined to particular structures of the body known as the serous and fibro-serous membranes. Such are the coverings of the joints, heart, lungs, and intestines, bones, muscles, brain, spinal cord, &c.; also the lining membranes of the heart, chest, substance of tendon and ligament, &c., &c. Rheumatism is observed in the *acute* and *chronic* forms.

Symptoms.—In the acute form, the early signs are general uneasiness and stiffness, the skin is dry and harsh, and the coat stares; the appetite is diminished and capricious, or with rumination probably suspended. The pulse is accelerated and harder than natural, mucous membranes redder than in health; the bowels are constipated, and urine rather scanty and deeper in colour. Suddenly one of the joints—a knee or hock—is found swollen, hot, and painful, which during the ensuing night

(without treatment) almost disappears, but the animal suffers from another which has become affected.

This disposition to pass from joint to joint is characteristic of rheumatism—a process known as *metastasis*; and it is highly probable that during such occurrences the pleura or lining membrane of the chest, or more generally the endocardium and pericardium—lining and covering of the heart—together with the valves, become affected, and the animal succumbs to rapid disease of the heart.

When rheumatism assumes the chronic form, it becomes almost stationary in one of the joints, or possibly the whole of one limb may be affected. The disease being confined to a joint, causes it to assume dimensions of an extreme character. It is hot, painful, and stiff, and the animal lies almost continually, losing flesh gradually, and eating little. In this way weeks may elapse without the appearance of benefit, and at length becomes nearly ankylosed or immovable, and presents the appearance given in the annexed engraving (Fig. 11). The soft tissues are removed, in order to show the state of the bones in which such extensive and serious changes of structure have been going on.

In other animals the whole limb above and below the joint also swells greatly; it is powerless, and great pain is endured. Abscesses form among the muscles, and discharge a surprising

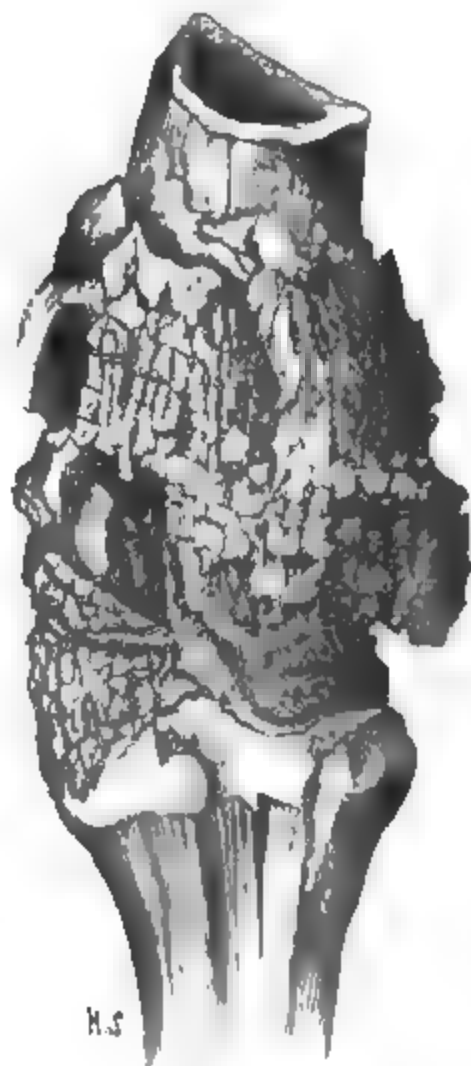


FIG. 11.—*Knee-joint of an Ox after Chronic Rheumatism.*

amount of pus. The animal suffers from continued fever, general prostration, and wasting, and the creature eventually sinks in a state of hectic.

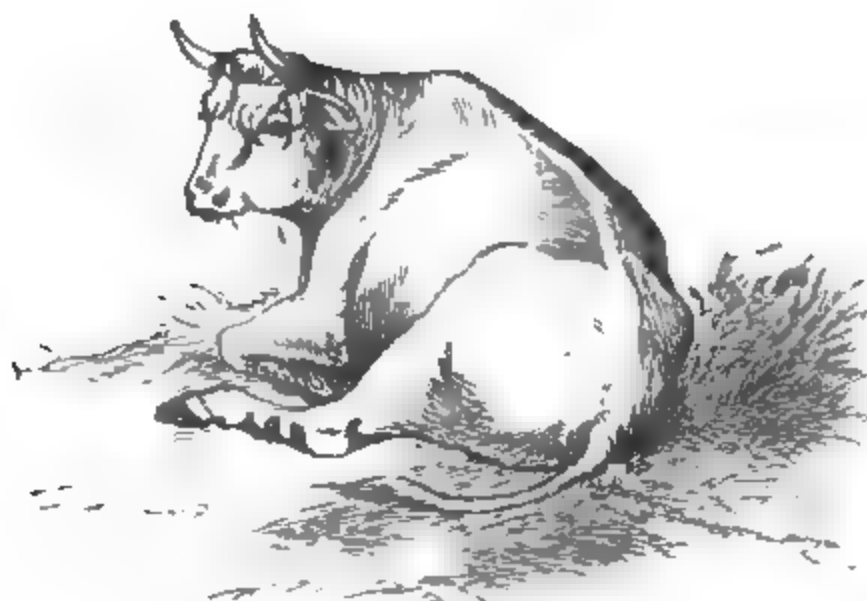


FIG. 12.—*Rheumatism affecting the Hind Leg.*

Treatment.—A moderate purgative, such as the following, may be given at once.

RECIPE NO. 12.

Take of Epsom salts.....	12 or 16 oz.
Powdered gentian and ginger, of each	2 „

Mix and combine with a pound of treacle and one quart of mild ale.

The joints are next to be attended to. The application of a stimulating embrocation is called for, which should be attended with smart friction during ten minutes or a quarter of an hour, and repeated twice a day as long as the swelling continues.

RECIPE NO. 13.

Take of soap liniment.....	8 oz.
Oil of turpentine	4 „
Laudanum	2 „

If there are evidences of fever continuing after the exhibition

Rheumatism or the Joint Felon. 55

of the purgative draught, give the following every eight hours until the pulse is softer and fuller:

RECIPE NO. 14.

Take of solution of the acetate of ammonia	4 oz.
Tincture of aconite	10 drops.
Water	$\frac{1}{2}$ pint

Mix.

Such a dose requires care, as, after frequent use, poisoning is apt to occur, unless the periods are regulated by the advice and attendance of a veterinary surgeon. In non-professional hands the following may be substituted :

RECIPE NO. 15.

Take of sulphate of potash	2 oz.
Sulphuric acid	1 or 2 drs.
Water	1 pint.

Mix, and (after solution) administer morning and evening.

When enlargement and stiffness remain after the acute signs are allayed, the joints may be rubbed morning and evening with the following embrocation :

RECIPE NO. 16.

Take of soap liniment.....	4 oz.
Tincture of iodine	3 "
" opium	1 "

Mix, and apply with smart friction.

During the treatment of rheumatic patients, good beds are required, and all protection from cold, draughts, rain, &c., must be afforded. The food may consist of grass, vetches, clover, roots or mashes of bran, in which boiled corn is mixed. Water, hay-tea, linseed-tea, &c., answer well for drink, and should be given when "the cold air has been taken off." Nutritious food will be required as signs of acute disease abate, and digestion may be promoted by the use of gentian and ginger in warm ale.

Animals having suffered from rheumatism are liable to repeated attacks, each of which acquires greater intensity than the first. The proprietor should observe more than ordinary attention towards preventing the disease, by securing absolute comfort and protection from the causes that are known to induce it. Liberal food and regular exercise should be allowed, and the animal made ready for the butcher as quickly as possible.—*Ed.*]

URÆMIA.

[By this term is understood a saturation of the system with the urine, which having no means of discharge, in consequence of some cause leading to retention, is absorbed, and carried by the circulation over the body. It is a state of blood poisoning.

Symptoms.—In addition to the ordinary signs given under “retention of urine” (page 127), there is observed dulness, loss of appetite, rumination absent, mouth slimy and foetid, evacuations scanty and hard, as well as offensive, respirations slow, pulse also slow and soft, pupils dilated, and a strong urinous odour arises from the skin, the coat stares, and temperature is low. These signs give way to coma and death.

Treatment must be begun early in order to be successful. The bladder must be evacuated at once, and means established which shall reduce the operation of the causes leading to the retention. These will be found detailed under the various affections of the urinary organs in Section V.—*Ed.*]

APNŒA—DIFFICULTY OF BREATHING.

[This condition frequently arises in sheep and lambs, as a result of a suppression of the functions of the skin, which is induced in the former by the use of sheep-salves for the destruction of parasites, and in the latter by the wearing of the hide of another lamb.

When ointments are largely used, the wool is matted together and attracts dust and dirt, which, combined, cause the fleece to assume the nature of an impermeable covering, and thus arrests the due discharge, by the pores of the skin, of pernicious matters from the blood. Carbonic acid, ammonia, and other organic products are collected, and the nutrition of the system cannot be proceeded with ; the blood is unable to circulate by reason of the heart being deprived of its stimulus—oxygen—and death ensues by apnœa or partial suffocation.

When mercury, or other poison employed as one of the ingredients of the ointment, is also absorbed into the system, death is probably more rapid, and the signs suffer modification. (See Section XIII.—Poisons.)

Symptoms of Apnœa.—The premonitory signs are seldom recognized by the shepherd or those in charge. These consist of weakness, dulness, distress, disinclination to move, capricious appetite, disturbed breathing, accelerated pulse, dilated nostrils, eyes staring and bloodshot, and irregular bowels. Usually the symptoms first observed are those of serious import, and the animals die in an hour or two. Suffocation is imminent ; the animal pants severely ; the pulse is small and frequent, and often indistinct ; the eyes become more prominent and deeply injected ; the pupils are widely dilated, and blindness often present, with a reeling gait ; great distress is evident, and the animal falls, violent struggles ensue, and large quantities of frothy mucous are ejected from the nose and mouth before death.

Post mortem Appearances.—General fluidity of the blood, and more or less congestion of the brain and various parts of the body, particularly the lungs. Right side of the heart is overcharged with dark and partially coagulated blood. The muscular system is also dark in colour, flabby, and death stiffening has been scarcely apparent. Sometimes spots of ecchymosis are found upon the various membranes.

Treatment.—Wash the ointment from the fleeces or shear the sheep. Remove the false hide from lambs wearing them, and sponge the body with tepid water in cold weather, and in both cases, if possible, apply friction to the skin by means of a brush, &c. If diarrhoea has not set in, give a laxative, and follow it up in one hour by repeated doses of the spirits of ammonia in water.—*Ed.*]

TUBERCULOSIS, TUBERCULAR CONSUMPTION, SCROFULA, PHTHISIS.

[In looking into the peculiar conditions of the animal system, we feel justified in placing this affection in the category of blood diseases. Hitherto it has been included with the affections of the respiratory organs, regardless of the fact that other parts of the body suffer equally with them. Most of the veterinary works are silent upon the subject.

Tuberculosis appears to be favoured by hereditary taint. Animals, particularly cows, of an attenuated form, thin and spare figure, finely bred, and of dainty habits, frequently breed calves which in adult age become affected with the disease. Nevertheless, tuberculosis appears at times, as far as history of the sufferers goes as evidence, to be totally independent of such influence; but we are not unable even then to account for the origin under certain constitutional peculiarities.

Nature.—In consequence of some unexplained condition of the system, the nutritious parts of the blood—the lymph or fibrine—is not raised to that degree of elaboration and perfection as is required for the proper nourishment of the tissues of the body. It is incapable of being built up into organized material, and is then termed *aplastic*. In such a condition it is even unfit for circulation, and its accumulation by constant formation would embarrass the whole system, and produce a speedy death. Nature therefore provides for its deposition in

localities where it will produce the least inconvenience: in those parts the particles become masses, and in process of time the aggregations are so immense as to interfere with life.

In man such accumulations are generally confined to the lungs, but other organs suffer as well, as the mesenteric glands. In the cow large masses are found beneath the lining membrane of the chest (pleura) at the base of the lungs, but unconnected with them, and also throughout the inner surfaces of the ribs, over the diaphragm (midriff), liver, intestines, kidneys, in the mesenteric glands, brain, &c., &c. Here the substance remains for some time without receiving any further development; but at length, it may be months after, signs of degeneration ensue, in which the material undergoes liquefaction, or is transformed into fatty or calcareous (lime-like) masses.

The matter of tubercle occurs in circumscribed masses, which vary in size from the head of a pin to that of a filbert. Such occurring on the different organs or inner sides of the ribs, are called by the butchers in Scotland "angle-berries:" they pare them off, and dispose of such flesh as sound and wholesome. In the vicinity of the lungs large quantities of matter frequently accumulate, half vascular, half calcareous or liquefied, and immense sacs form near the kidneys. The writer took out the lungs and heart of a cow some time ago, which, under this affection, weighed seventy-five pounds, besides other large masses that were undergoing degeneration, half cheesy, half calcareous.

Animals that are abundant milkers are prone to the affection; those also affected with nymphomania, or what are commonly known as "bullers," exhibit a great tendency towards it. But these are mere evidences of a condition already present; both may be regarded as effects rather than the cause, and an inability to elaborate the material necessary to the welfare of the functions. The milk in such instances is of a very inferior quality, blue and watery, and destitute of that amount

of nutrition it is generally supposed to possess. When the affection is principally located within the mesenteric glands, it is known as *tabes mesenterica*, &c., &c., and more commonly as consumption of the bowels. Animals suffering from this form are called "piners" in Scotland.

Symptoms.—Generally the earliest signs are those of anæmia, The heart-beats are loud, but the pulse is feeble and small; the appetite is capricious, and a slight cough exists, with dullness. All these are of gradual development, throughout which the secretion of milk has suffered no diminution. In a week or two emaciation is perceived to be progressing rapidly, which in well-bred animals appears to enhance their symmetrical appearance for a time, when they merge into a wan, skeleton-like form. The skin now looks dull, and is tightly bound down to the tissues below, the coat stares and feels harsh and dry, and sometimes jaundice or yellowness of the skin prevails. The various external glands of the body are sometimes swollen from deposition of tubercular matter within their substance, the parotid and submaxillary glands being most commonly affected. The cough now becomes oppressive, and when the disease assumes extensive characters, the animal evidently suffers extremely, as depicted by the arched back,

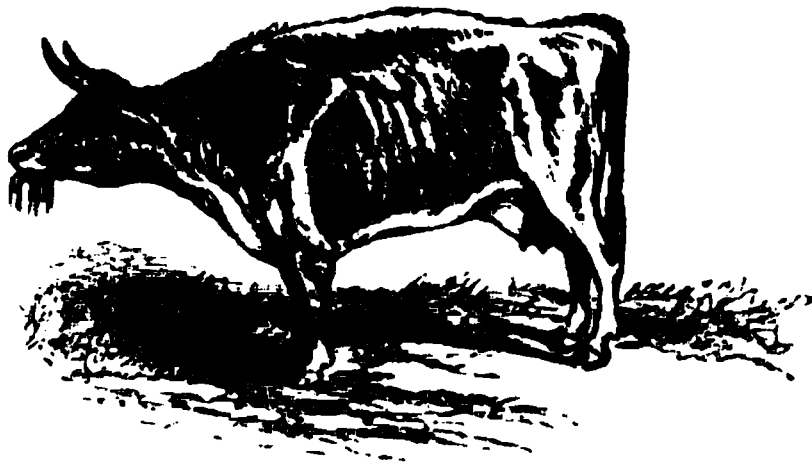


FIG. 13.

obstinately refusing to move, head low and protruded, mouth open, with free flow of saliva, and tongue hanging loose, ears

drooping, anxious countenance, and uttering a plaintive moan at intervals. The pulse becomes rapid, small, and weak, the beats being upwards of ninety or a hundred. Horns, ears, and extremities are cold, nose dry, mouth hot. The rumen is frequently found filled with food, which is felt in the left flank as a semi-plastic mass, pressure causing depressions that do not disappear, but no pain. The action of the organ is frequently arrested, but the absence of tympany (gas) leaves unexplained the embarrassed breathing. A long groan is uttered in expiration, and the inspiration is irregular, and even spasmodic, not unlike a gasp. Auscultation decides that the lungs are pervious to the passage of air throughout their greater substance, but percussion causes the animal to shrink from the blow, and groan mournfully, particularly when it is directed upon each side of the spine and as far as the disease extends, which sometimes is nearly the whole length. Discharges occasionally occur from the eyes and nose, and diarrhoea of a passive character is established; wasting continues, the symptoms slowly acquire urgency, hectic is established, and terminates a lingering affection, the tokens of which have probably excited much conjecture and even astonishment in non-professional minds.

Post mortem Appearances.—The surface of the membrane lining the chest (pleura) is found studded with a number of irregularly-shaped masses of various sizes—some as small as mustard-seeds, others as large as a horse-bean or hazel-nut. The lungs in some instances also exhibit the same on their surface, or within their substance, when small abscesses may have formed around them. The liver, mesenteric glands, peritoneum, and even intestines are sometimes studded externally with them. It is usual when these organs are removed that the abundance of deposit is found. Extending along the spine, between the lobes of the lungs, from the front of the thorax (chest) to the kidneys in the abdomen, are masses of a yellow cheesy-looking substance, enclosed in serous membrane. Some-

times separate conglomerations appear, which are half vascular, half calcareous, or fatty, and which present a mottled or marbled aspect, red, pale yellow, white, or grey, and orange-yellow masses intermingling with each other. The body is almost bloodless, and that which remains is thin and uncoagulable; all the tissues are wasted, and the muscles are pale, flabby, and lack their natural moisture.

The condition of the superficial glands, already noticed as having become enlarged during life, present similar appearances throughout their structure.

The local forms of this affection have been described in former editions of the work under the following head.—*Ed.*]

CANCEROUS ULCERS.

These are the most difficult to heal of any ulcers to which horned cattle are liable. They generally make their appearance in a hard livid tumour, seated in some glandulous parts of the body. Some of these are movable, and others are more fixed; some are inflamed, and quickly break out, and discharge a thin acrid ichor; at other times they discharge a thick yellow matter, and the wounds are apt to fill up with fungous flesh. The Author has seen several ulcers of this description that have baffled the powers of medicine to heal them. These have been chiefly on the cheeks, eyelids, and on the glands between the jaw-bones. They are supported by a scrofulous tendency of the neighbouring fluids.

[In certain districts there is a great disposition for the parotid glands to swell greatly, and for a time present a very hard but painful tumour, which, however, does not always interfere much with the animal's masticatory powers. (Fig. 14.) Shortly, this becomes a soft, diffused, fluctuating sac, which has only the skin for its covering, and, on being opened, discharges a large quantity of foetid, degenerated pus. This disease is known as

"cliers" in Scotland. The healing powers are tardy, and the swelling is apt to recur from time to time.



FIG. 14.



FIG. 15.

The bones also are implicated under a scrofulous diathesis, and present another local form, which proves troublesome in a variety of ways. The jaws, both upper and lower, are apt to suffer; and upon them form large tumours, which interfere very much with mastication and condition. (Fig. 15.) The engraving



FIG. 16.



FIG. 17.

represents a bull suffering from an enlargement of the kind referred to, implicating the superior maxillary bone. Fig. 16 represents one of the same kind upon the lower jaw. In the vernacular and among quacks and farriers, these tumours

are denominated "cancers," and sometimes "canker." Their practice consists in deluding farmers and others that they can remove such by a simple dressing, and the animal "will thrive as well as ever afterwards." This dressing usually consists of some severe caustic mixture, which causes the parts to slough; but, as agents of this kind have no respect to tissue, acting on sound as well as unsound, the results are generally unfavourable. Fig. 17 represents the bull after the wrongly-named cancer had been removed by a "quack:" the whole of the cheek had sloughed, as well as some of the bones of the face, and the food as taken into the mouth passed out of the opening. Absorption of the poisonous ingredients also took place, the animal was overtaken by paralysis, and he was humanely shot by the owner, who had become disgusted at the sight.

Such tumours appear in cows, bulls, and steers between the ages of two and six years. Steers and cows are most commonly affected. At first the disease appears as a small round painful nodule, which gradually enlarges beneath the skin, but preserving a perfect separation, the latter moving over it with ease and freedom. When, however, any irritating applications are applied, or the parts are struck, inflammation is set up, followed by ulceration. The mass exposes a raw discharging surface, great pain is felt in mastication, the bones are further invaded, teeth become loose and eventually drop out, and not uncommonly a communication is established with the mouth. Such tumours occupy months in their formation, being the result of an imperfect development already referred to. The soft tissues immediately in connection are converted into a thick dense fibrous mass; the bone is changed into a porous body, having large cavities enclosing granular accumulations and formed of sharp thin bony plates. Such diseases have received the various names of *spina ventosa*, *ostea sarcoma*, and *fibro-plastic degeneration of bone*.

Treatment.—Animals affected with tuberculosis are decidedly incurable in the present stage of veterinary science, and in that particular we are not behind our brethren in the medical profession, who as yet can do no more with consumption in the human subject. The line of treatment is purely one of a dietary nature, and the food should contain the fatty and starchy principles in the most assimilable form. For this purpose linseed cake is useful, and the various kinds of corn ground into flour, particularly peas. Linseed oil, in doses of two or three ounces, morning and evening, greatly assists digestion and assimilation when given with the above. Domestic attention is imperatively called for, including cleanliness and ventilation of the first order, and careful preparation of all food, with a view to its being of easy digestion and in proper supply. Iron tonics should be given with caution, a form of which is subjoined.

RECIPE NO. 17.

Take of saccharized carbonate of iron	2 drs.
Powdered columbo	2 „

Mix, and give morning and evening, in the early stages of the disease, during a fortnight or a few days longer, allowing a week or thereabouts to elapse, when the medicine may be continued; and so on alternately, until the animal obtains flesh, and can be removed to the butcher. When the affection has reached the extreme stages, and wasting has commenced, with glandular enlargement, the flesh is no longer suitable for human food.

In the form known as cliers, the animal should receive similar treatment. The abscess in the parotid gland should be opened, and healing action induced by strong injections of some caustic mixture, as the following :

RECIPE NO. 18.

Take of butyr of antimony	1 oz.
Tincture of myrrh	2 „

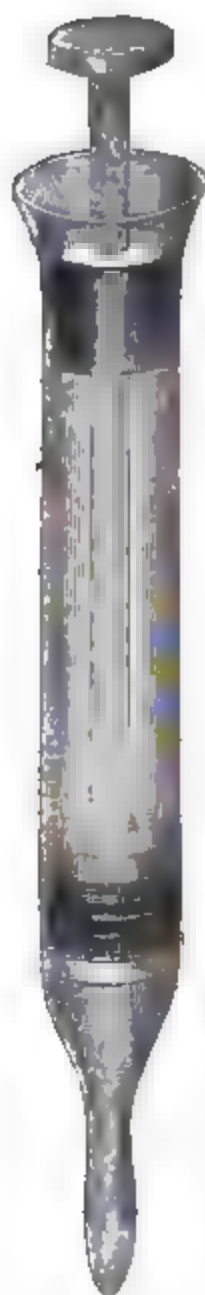


FIG. 18.

Inject, by means of the glass syringe as shown in Fig. 18, once daily. The various preparations of biniodide of mercury, red precipitate, mineral acids, &c., are sometimes used, but the above will be found sufficient for most purposes.

When tumours form upon the bones, as described, the proprietor should at once seek a definite opinion, and have the necessary constitutional treatment adopted in order to promote the laying on of flesh. If mastication is impeded, or the disease assumes a general form, all hope of profit in the animal may be lost. No outward applications will effectually remove scrofulous tumours, therefore they are best left alone, acting on advice sought with a view towards making up the animal for the butcher.—*Ed.*]

PURPURA HÆMORRHAGICA.

[This affection is frequently observed in the horse and among swine, but is less common to bovine and ovine animals. Calves have suffered more from it in the writer's experience than adults, but it is likely to occur in them under certain conditions.

Nature.—A specific blood disease, in which local manifestations are confined in major part to the skin, and next to analogous tissues, as mucous membranes, cellular tissue, certain portions of organs, as the parenchyma of the lungs and kidneys, and the parts between the coats of the intestines.

Causes.—Poverty and bad living, exposure to cold, and other debilitating influences: previous severe diseases are fertile causes. It sometimes occurs in young animals that are

growing rapidly, when the food supplied is not sufficiently nutritive.

Symptoms.—Diffused swellings of variable form and extent, by which the skin is elevated. Preference is given to all dependent parts, and those covered with loose skin, as the head, face, dewlap, beneath the chest and abdomen, and between the legs. These are sometimes rapid in their formation, at others slow. If the membranes of the eyes, nose, mouth, and vulva (shape) in cows are examined, they will be found to be studded with purple spots (*petechiæ*). Motion is difficult from effusion between and around muscles. The pulse is full at first, but rapidly becomes small, hard, and wiry, a stage at which the malady is most commonly detected.

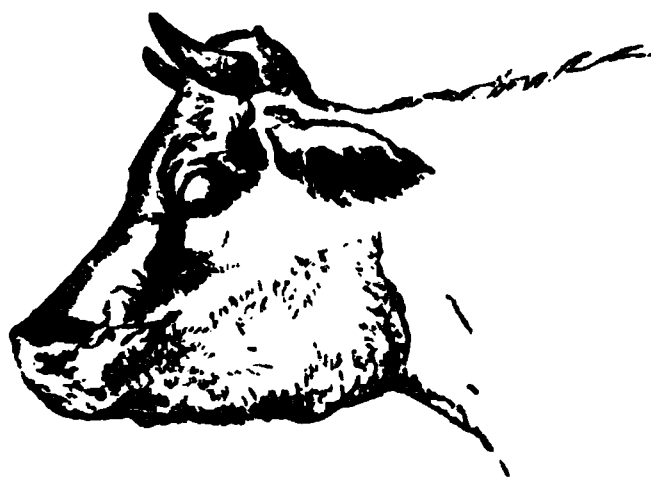


FIG. 19.

As the disease advances, the swellings are covered with a reddish-yellow-looking fluid that oozes through the skin; sometimes blood itself issues in rapid drops from numerous points over the whole surface of the body. The eyes, nose, face, throat, and neck are involved, as represented in Fig. 19, in a diffuse swelling, obstructing vision, deglutition, swallowing, and even breathing. The pulse becomes weaker, and if the animal has partaken of food and drink up to the present, he does so no longer. Milk has suddenly ceased in dairy stock, and the small quantity that is drawn is mixed with blood. The bowels, at first costive, are now loose; prostration of strength is great,

abdominal pains ensue, breathing is difficult, urine albuminous and mixed with blood. Sometimes large ulcers form in the locality of swellings, but usually the animal dies before such a stage is reached.

Post mortem Appearances.—All parts of the body where space admits, as beneath the skin, between muscles, and the coats of the intestines, &c., &c., are filled with dark or purple-black fluid blood, and an admixture of lymph. The structures are thus caused to assume a purple or Modena red colour. In all parts characterized by little or no motion the deposits are profuse. The membranes covering the abdominal viscera (peritoneum) and that of the chest (pleura) are studded with patches called ecchymosis, or extravasated blood. The heart, bladder, brain, and nervous system are also similarly affected.

Duration, Prognosis, &c.—Fatal cases occur in from two to six or seven days. Among cattle the Author has known it to be rarely otherwise than a highly destructive disease; doubtless aggravated much by delay in calling for assistance. Favourable cases are betokened by return of strength, decline of fever, resumption of appetite and secretions, with cessation of superficial effusion, and disappearance of swelling. The pulse also becomes fuller and stronger, strength returns, movement is easier, and the animal lies down; appetite returns, pain subsides, &c.

Treatment.—It is highly useful to move the bowels gently during constipation, by the use of such a draught as the following:

RECIPE NO. 19.

Take of pure linseed oil	1 pt.
Sulphuric ether.....	1 oz.
Infusion of quassia	4 „

Mix, and administer to a cow: one-half will be sufficient for a year-old stirk, and one-third for lesser animals. In some cases that appear to depend on an unnatural plethora, a mode-

rate bloodletting is serviceable, if conducted during the time the pulse remains full and tolerably strong. Turpentine is a very valuable remedy as a constringent agent or styptic to the relaxed blood-vessels; but its use must be watched very narrowly, as the urinary organs are liable to be irritated by it. Full dozes are one or two ounces two or three times a day, given with white of eggs, gruel, &c. The next agents are the mineral acids, as the sulphuric, nitric, or hydrochloric, which may be given as follows:

RECIPE NO. 20.

Take of sulphuric acid or oil of vitriol (pure)...	2 or 3 drs.
Infusion of quassia, columbo, or gentian	$\frac{1}{2}$ pt.
Ale or porter	1 qt.

Mix.

RECIPE NO. 21.

Take nitric acid or aqua fortis (pure)	2 or 3 drs.
Infusions, &c., as above.	

Mix.

RECIPE NO. 22.

Take of hydrochloric acid or spirits of salt (pure),	2 or 3 drs.
With the infusions, &c., as above.	

Mix. Either of these draughts are sufficient for a moderate-sized cow, and should be repeated two or three times a day. Half-doses for year-old stirks, and one-third or one-fourth for lesser animals. Mineral tonics (as the sulphate of iron, in doses of one or two drams) will also be found of service after two or three days have elapsed. The best menstruum is ale, porter, or an infusion of quassia. Diffusible stimulants are required when great debility occurs; such as the following forms are especially called for:

RECIPE NO. 23.

Take of spirits of nitric ether.....	2 oz.
Warm ale	1 pt.

Mix, and administer three or four times during the day.

RECIPE No. 24.

Take of aromatic spirits of ammonia or sal volatile... 1 oz.
Cold ale 1 pt.

Mix, and use alternately with or instead of the last.

Good food, cleanliness, clothing, proper ventilation, housing, and all domestic comfort must be secured. Green food, or carrots, turnips, &c., &c., are specially called for when the appetite returns.—*Ed.*]

**B.—BLOOD DISEASES ARISING FROM AN IN-
ORDINATE, IMPAIRED, OR ARRESTED
FUNCTION, WHICH PREVAIL AS EN-
ZOÖTICS, viz. :**

MALIGNANT CATARRH.

ARTHRITIS, OR JOINT-ILL IN LAMBS AND CALVES.

ASTHENIC HÆMATURIA IN CATTLE.

MALIGNANT SORE THROAT.

**MALIGNANT CATARRH OR CORYZA, *known also as*
CORYZA GANGRENOZA.**

[This affection has been confounded with purpura hæmorrhagica and cattle plague or rinderpest, in some points of which great resemblance exists.

Nature.—A specific or malignant condition of the blood in which catarrhal signs are prominent, affecting chiefly the sinuses of the head in young cattle and oxen generally. Old cows are seldom affected. It has been denominated “glanders of the ox tribe.”

Symptoms.—Three stages of the affection may be described, In the *first*, a shivering-fit may be observed, and the animal is separated from the rest in the pasture. Shortly he is dull, the head is held low, ears pendulous, visible membranes are of a bluish-red colour and dry. The eyes are closed and swollen. Tears flow, and light cannot be endured. The muzzle is dry and hot, and saliva is sometimes discharged abundantly. There is a painful cough, pulse is frequent and full, but the heart's action is feeble. The cough becomes even more painful as the

disease advances, and the breathing is accelerated and sometimes catching. The bowels are costive, fæces black and hard, but shortly diarrhoea ensues. The animal is thirsty, but eats nothing, and the urine is scanty, offensive, and has a high colour.



FIG. 20.—*Malignant Catarrh, first stages.*

The *second stage* occurs within eighteen or twenty-four hours from the appearance of the first signs of disturbance, and are denoted by a marked change in the character of the discharges. The membranes of the eyes and nose now furnish a purulent secretion, having an admixture of blood and ichor, which irritates and makes sore the skin over which it flows. Within the sinuses of the head large accumulations of pus occur, and when the bones over them are tapped by the fingers (percussed) a dull sound is emitted. If the mouth is opened, red patches will be observed, which in some places will have fallen off, exposing a foul ulcer beneath, and the membranes are now of a deeper purple hue, and the breath fœtid. The animal is lame, and experiences great pain when urine or dung is discharged. Pregnant animals are almost sure to cast their young (abort). From the first an increase of temperature may be noticed, but now the thermometer registers 104° or 105° F.

Third stage.—Great prostration is evident. Sloughing of membranes extensive, and probably the horns and hoofs have

come off. The pulse has become imperceptible ; convulsions ensue, with general coldness. The thermometer indicates a rapid and unusual fall, 90° to 95° F. being the amount of heat



FIG. 21.—*Malignant Catarrh, second or Sloughing stage.*
Horn removed, and ulcerations have appeared on Nose and Lips, &c.

than can be registered at the rectum. Sometimes ulceration of the cornea is effected before death, and the contents of the eye-ball are discharged, giving rise to a great amount of additional pain.

Post mortem Appearances.—These will be apparent, having alluded to them greatly in an enumeration of the signs. The whole series of membranes—mucous and serous—are studded with ecchymosis, and sometimes the brain and spinal cord afford signs of inflammatory action and softening, while the cavities contain an increased quantity of fluid. The whole organs of the body are softened and congested, and the blood-vessels are filled with dark or black fluid blood. The sinuses of the head are filled with offensive pus, the bones are softened, lining membranes covered in places with blue or purple spots, while at others the epithelium is removed, and angry-looking

ulcers occupy its place, having discharged blood before death. The surface of mucous membranes have a livid or Modena red colour. Removal of epithelium, with the changes just stated, are also common to the back of the mouth, fauces, gullet, wind-pipe, stomach, and intestines generally.

Diagnosis.—Malignant catarrh may be confounded with cattle plague (rinderpest), and purpura hæmorrhagica. It is, however, distinguished by the following tests. From rinderpest it is known by the fact that young animals and oxen are chiefly affected; that it occurs after exposure to cold rains, &c.; that only one, or perhaps at most two, out of a herd are seized, and with their death the affection ceases, thereby deciding its non-contagious nature. From purpura hæmorrhagica it is known by the absence of diffused swellings and sanguineous (bloody) or sero-sanguineous (blood and serum) exudations from the skin.

Duration.—From four to nine or eleven days. The writer's experience of the affection has been confined to some of the most rapid cases.

Treatment.—Remove the animal from the pasture, and place it in a comfortable cool place with good bedding. Cooling or evaporating lotions (Nos. 2, 3, 4, 5, 6, pp. 30 and 31), water, &c., should be constantly applied to the head. Bleeding moderately while the pulse is full may be attended with benefit. Injections should be thrown up, and a laxative dose administered, such as the oil mixture recommended for purpura hæmorrhagica (page 68), or the following drench :

RECIPE NO. 25.

Take of Epsom salts	12 oz.
Colomel.....	15 grs.
Ground ginger.....	2 oz.
Treacle	$\frac{1}{2}$ lb.
Warm ale	1 $\frac{1}{2}$ pts.

Mix, and give to a two-year-old beast; two-thirds for one a

year old ; half at six months ; and quarter for lesser animals, as calves, sheep, and large pigs. A long seton placed in the dewlap in the earliest stages also proves beneficial. Two to four drams of nitre may be given in water three or four times a day. Acetate of ammonia, also, in doses of one to four ounces at similar intervals, in water, during the existence of great fever.

When the animal is found at the termination of the second stages, mineral acids should be given after the laxative medicine—such draughts as are recommended in Recipes Nos. 20, 21, 22, page 69. Solutions of carbolic acid or sulphurous acid gas and chlorine in water should be used for the purpose of dressing the wounds and cleansing the points of discharge, &c. It may also be necessary to open the sinuses and syringe them, using the same solutions. Sometimes setons passed through them are beneficial. Frequent stimulants are needed from the commencement of the second stages.—*Ed.*]

ARTHRITIS OR JOINT-ILL IN LAMBS AND CALVES.

[Under the above title we have to notice an affection in lambs and calves which has attracted notice during late years, more particularly as it has been observed to prevail more commonly than heretofore. Mr. Robertson, M.R.C.V.S. Kelso, a friend of the Editor, has paid great attention to this disease, and his views are particularly worthy of note.

Two forms are recognized, though it not unfrequently happens they are combined in the same animal. The first appears purely of a rheumatic character, and is often observed in calves ; the second is dependent upon a scrofulous character and hereditary taint. In a combination of these we may, with some degree of accuracy, view it as a third variety. It may also appear in conjunction with navel-ill, page 127.

Symptoms.—The signs are generally of a very sudden cha-

racter, and appear when the animal has arrived at the age of several weeks. One of the joints is severely affected : it is swollen, the capsule distended, and exquisitely painful. Fever runs high, surface heat is increased, and the thermometer shows an augmentation internally ; the visible mucous membranes are deeply injected, respiration accelerated, and lameness very acute. The pulse is rapid and hard, bowels costive, urine deficient and highly coloured, appetite and rumination suspended or absent. A great peculiarity of the rheumatic form consists in the sudden disappearance of local signs from the



FIG. 22.—Section of Thigh-bone (healthy).

affected joint, and their equally abrupt appearance in one or two others previously sound, or probably total subsidence—the parts being restored by the usual process of resolution. This latter is, however, not general or common ; on the contrary, the disease frequently continues, and the joints are permanently diseased. Effusion of lymph occurs, the articulation is damaged, bones inflame (ostitis), and the functions are no longer discharged ; it then becomes stiff and immovable from the deposit of ossific matter, which brings the whole of the surfaces into a state of union (ankylosis), as shown in Fig. 11. In the *scrofulous form* the mobility of the joint is not always particularly affected. The disease is located within the porous substance which fills up the ends of bones,

called cancellated or spongy tissue. Here we have characteristic distinctions which sufficiently separate this form of disease from the rheumatic variety. Instead of the greatly distended and painful capsule of the joint or articulation, we have decided swelling of the bones above and below. Tubercular matter is deposited within the substance of the osseous tissue, which leads to degeneration, formation of pus, porosity, and enlargement, the discharge not unfrequently taking place within the capsule of the joint itself. In addition, we have the usual evidences of fever, and the most distinctive sign cognoscible of the disease is the fact that these conditions have not appeared suddenly, but that they were born with the animal. The system also exhibits the peculiar scrofulous cachexy, or tendency towards tuberculous deposit. Enlargements appear about the navel at birth; the belly is pendulous and enlarged, in consequence of the presence of a quantity of an opaque or turbid fluid within the abdomen. The umbilical cord does not undergo the usual change of contraction, but becomes the seat of numerous cysts containing tuberculous matter. The liver also and the omentum contain similar deposits. Wasting and general emaciation follow, and a small percentage only recover, these betraying the greatest possible difficulty in any approach towards being remunerative, in the face of the trouble and delay they have occasioned.

Such a description will convey to the curious reader the fact that the disease is due to hereditary influences; therefore, in order to restrict the operations of the evil tendencies, great care should be exercised in the selection of breeding stock, and its treatment during pregnancy. Medical means are of little avail in the chronic forms of arthritis; and in the acute



FIG. 23.—*Bone enlarged from Tubercular Deposit, and hollowed by formation of subsequent abscess.*

stages, success entirely depends upon their being promptly instituted.

In order to guard against the occurrence of tuberculous conditions, breeding must be conducted from sound healthy stock. Animals possessing a weedy character, long thin neck, inferior and narrow chest and loins, pale membranes and weakly-looking eyes, pot-bellied and attenuated appearance, or any approach to such conditions, are those which generally possess the seeds of tuberculosis in their bodies, and should be isolated from those intended for breeding purposes.

But the condition is induced in others apparently healthy, as well as their offspring, by irregular, inferior, and deficient food, climate, soil, housing, and other influences that obstruct the general process of assimilation. The laws of health require great attention, and when they are more generally understood, we shall hear less of these tedious and harassing cases of arthritic diseases in lambs and calves.

Medical Treatment.—Perfect stillness must be secured for the affected joints, particularly in young and weakly animals, which may be secured in some instances by the use of starch bandages ; in others the use of strong tincture or ointments of iodine, and even blistering ointment, is attended with marked benefit. Internally the following medicines may be variously used :

RECIPE NO. 26.

Take of solution of acetate of ammonia.....	2 oz.
Tincture of aconite.....	10 drops.
Water	$\frac{1}{2}$ pt.

Mix, and give to a calf night and morning, and one-fourth to lambs.

Another good remedy is the acetate of potash, which may be given in the following form :

RECIPE NO. 27.

Take of acetate of potash.....	1 dram.
Aconite	5 drops.
Water	$\frac{1}{2}$ pt.

Mix : to be given to a calf two or three times a day, or one-fourth to a lamb during the same intervals.

Returning appetite, disappearance of pain, &c., must receive careful consideration. Too much food must not be allowed, but small quantities of a highly nutritious character, with which tonics must be given.

RECIPE NO. 28.

Take of syrup of the iodide of iron.....	3 fluid drs.
Water	10 „ oz.

Mix : a dose for a calf morning and evening, and one-half for lambs. This should be always given when the stomach contains a small quantity of food, if possible.—*Ed.*]

ASTHENIC HÆMATURIA, *commonly known as* RED WATER, BLACK WATER, &c.

[This is a form of hæmaturia included under the variety known as *idiopathic*, or arising from causes not always sufficiently apparent, being generally of a multiplied character. The term hæmaturia signifies a discharge of blood in urine, and as an attempt to describe with more fitting exactness the nature of the affection, that of *hæmo-albuminuria* has been suggested.

The affection is characterized by enzoötic tendencies. The peculiarities of season limiting the quantity of good and natural aliment, drives cattle and sheep to partake of plants, the nature of which particularly unfits them either as articles of food or nutrition : they are rather to be viewed as of foreign and even irritant properties. The locality and position of land favouring undue moisture, or by being inefficiently drained and manured, producing crops of an inferior kind, is a prolific cause. It has been said to be a disease common to the poor man's cow, and it may be also said with equal truthfulness, that red water is a disease of bad farm management generally.

Eminently a disease in which the vital properties of the blood are interfered with, the constitution of that fluid is

severely reduced. We have seen that the blood is maintained by a process peculiarly its own, as a result of the digestion and assimilation of food. In the preparation of those materials necessary for the blood, the digestive organs, comprising the liver, pancreas, spleen, stomach, and intestines, &c., must be in perfect order; but when their action is arrested or perverted by the presence of foreign bodies in large quantities, as badly-grown turnips, indigestible and unsuitable plants, &c., the blood formation is seriously damaged. The red corpuscles lack their proper degree of stability, and other component parts are without their necessary elaboration and constitution. There can, therefore, be no difficulty in understanding that, with the blood as an improperly constituted or elaborated fluid, the secretions of the body will be greatly deficient, general nutrition reduced, and the office of the kidneys to separate the unnatural constituents greatly increased, and, by the weakness that naturally follows, their functions greatly perverted.

The practice of feeding stall-fed cattle as well as others upon large quantities of turnips in cold weather, has not been sufficiently considered by owners of cattle, particularly those kinds that are the produce of ill-drained and ill-manured lands. Besides their want of proper sustenance, their physical effects, as containing an immense proportion of water (70 to 90 per cent.), and particularly by communicating a great degree of unnatural cold to the system, have a potent influence upon the resources of animal heat. The process is retarded, and blood-formation cannot go on efficiently. We must remember that the rumen alone of a cow can accommodate a large quantity—two and even three bushels—of food. Suppose the greater portion of the contents of that compartment is made up of turnips, 100 parts of which contain 75 parts of water. The mass must receive warmth before it can become assimilated, and it robs the stomach, liver, and *all* parts of the body of the necessary heat before it can pass. Turnips are

not unfrequently ice-cold—32° F.—when given, and the mass within the stomach is a long time before it can reach the temperature called blood heat, viz., 100° F. It is not, therefore, uncommon to find the contents of the rumen at a very low temperature in animals dying shortly after the stomach has been charged with such an unnatural mass. The nutritious principles of the food also are too much diluted, and liable to pass too quickly out of the body by the intestines, and thus are lost to the system. Turnips at the best contain but a very small quantity of the albuminous or flesh-forming constituents, and when they become too exclusively the food of cattle and sheep, the repair of the system is not properly provided for. The whole, therefore, reduces the nervous system, destroys the tone of the digestive organs, and disease is the result. One of the most common out of many kinds taking place from the same cause is red water, so called.

Nature.—This affection may be termed a blood disease, the result of imperfect digestion and assimilation, characterized by the degeneracy of the plastic materials and corpuscles of the blood, and their discharge through the kidneys in an altered condition. Asthenic hæmaturia affects both cattle and sheep, and is attended with a great amount of debility; hence the term asthenic, which has been applied to it. Cows are most commonly affected, a fact which may be attributed to the demands made upon the system by the secretion of milk and process of gestation. Among sheep, ewes are principally seized.

Symptoms.—Throughout the progress of the malady the tendency towards anæmia is present. This will be at once apparent after what has been said regarding the arrest placed upon the assimilative functions and organs of digestion, culminating in a false or deficient formation of blood material. The cow also exhibits a tendency to rapid emaciation from the same cause, weakness is great, and increases as the disease advances; the heart-beats are heard at some distance, as a

result of the thin watery state of the blood in advanced cases, and the venous pulse is well developed in the jugular veins. Allied to, and depending upon, these states, may also be observed extreme coldness of the extremities and body generally, pulse feeble and frequent, paleness of the mucous membranes, and such indications that betoken a bloodless state of the whole system. These signs, however, are progressive, and appear somewhat in the following order :

In the *first stage* the animal exhibits signs of general derangement, as suspended appetite, rumination, and probably also of milk, particularly if diarrhœa is present at the outset. When the bowels are acting properly, the disease is more easily overcome; but usually diarrhœa of an obstinate form is present, or succeeds rapidly the confined state of the bowels. The skin becomes harsh and dry, the coat stares, and a yellow tinge, with a quantity of scurf and dirt, is seen between the erect hairs. A degree of dulness is visible, and the animal no longer associates with the rest when in the pasture; the eyes present an unusually sunken and haggard appearance; the back is arched upwards, abdomen pendulous, and sometimes distended, or flanks hollow; flesh wastes, the pulse becomes frequent and feeble, general coldness prevails, mucous membranes are blanched, and sometimes slight colicky pains arise, causing a little uneasiness, or the creature prefers to lie persistently. If diarrhœa is present, the urine may not possess a deep colour; but under constipation, and diseases of other secretions, it is red, reddish-brown, or dark claret colour, and a slight degree of pain is evident on urination.

The *second stage* may be entered before the expiration of forty-eight hours. When the respiration is disturbed, the pulse becomes smaller, more frequent, and feeble in character; the anæmic murmurs of the heart are loud and strong, and the venous pulse fully developed; constipation is decided, and urination more frequent, but the discharge is less, accompanied

with greater pain, and has acquired a foetid odour and a deeper colour; it is now nearly black, and of greater density. Such signs progress with greater or less rapidity and intensity for one or two days, when speedily the *third stage* is developed. Abdominal pains are frequent, and the animal moans in a melancholy manner; coldness, exhaustion, and emaciation have rapidly progressed; the pulse has become indistinct, the anæmic

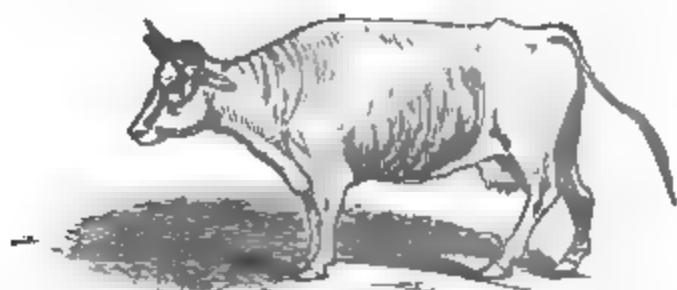


FIG. 24.—*Asthenic Hæmaturia—Red Water.*

murmurs of the heart are but feebly heard, or are absent; mouth cold; the animal has no power to rise, gives no evidence of attention to surrounding objects, and in this manner sinks about the third or fourth day.

In some instances an intense thirst marks the second stage at commencement, when the difficulty that has existed against the action of purgative medicine gives way, the contents of the stomach absorbs the fluid as it is drank, and relaxation follows. The symptoms of constitutional disturbance gradually subside, the urine gives less pain on emission, is more copious, somewhat lighter in colour, thinner, and less offensive, and general improvement may follow. At other times these signs are but the precursors of a more protracted stage, and the creature dies at variable periods.

Post mortem Appearances.—The carcasses of animals dying from this disease are pale and greatly emaciated, and the blood-vessels, including even the heart itself, are nearly destitute of blood. The appearances as concerning the latter condition greatly resemble that observed after animals have

been bled to death. The signs of blood poisoning are also frequently present in the forms of patches of ecchymosis upon the serous membranes, more especially inside the cavities of the heart. The liver is congested and softened, the gall bladder full, kidneys pale, but structural disease not apparent, except in prepared microscopic specimens, which display an enlarged condition of the parts called the malphigian tufts and conduits leading from them ; a fact that points out more plainly that the blood has undergone its state of degeneracy within the circulatory system, and not in the structure of the kidneys, as was formerly supposed.

From the readily soluble property of the colouring matter of the blood in water, the fluid effused from the blood-vessels at various parts carries with it the characteristic tinge, communicates it to all the neighbouring tissues, and produces stains sometimes viewed as inflammation. The organs contiguous to the kidneys are frequently tinged also with the colouring matter of the bile, assuming a yellowish-red appearance. A turgid condition of the mucous membrane, of the small intestines, and sometimes of the fourth stomach also, is frequently observed, and likewise falsely regarded as inflammation. The rumen contains a fair quantity of food, and the third compartment—manyplies or omasum—is acutely constipated, hard, and filled to repletion ; the epithelial coat is readily detached, when portions of the food are moved. The second and fourth stomachs are empty, or the former contains only fluid, and the lining membrane of the latter, with that of the small intestines, is coated with a layer of mucous, having a chocolate colour, from an admixture with blood material.

The *urine* of this disease exhibits characteristic peculiarities. The density is considerably increased, reaching to 1,050 or more ; the colour a dirty red, or even black, and odour that of decaying animal matter. The colour of the urine is greatly dependent upon the stage of the disease, as inducing oxidation

of the iron which accompanies the blood, and also degeneracy of the whole blood material. Such urine, allowed to stand at rest, deposits a copious sediment in which the presence of epithelial cells, oxalate of lime, and certain triple phosphates are present. Albumen is already detected by the usual tests, and iron in variable quantity; but, as a rule, the inorganic constituents of the blood, upon which so much stress has been laid, are really much below the normal standard: the whole progress of blood manufacture has been suspended, therefore they cannot be present in normal quantity.

Treatment.—The proper course is to attempt the removal of all undigested and indigestible matters from the stomach, as causes of the disease, and promote the healthy functions of digestion and assimilation. For this purpose the stomach which contains the offending causes should be acted upon as briskly as possible. Such remarks, it must be understood, apply only to the earlier stage of the malady. For a moderate-sized cow, the following proportions may be given :

RECIPE NO. 29.

Take of Epsom salts	16 to	24 oz.
Calomel.....	1 to	2 drs.
Croton	15 to	30 drops.
Gentian and ginger, of each		1 oz.

Mix: administer with plenty of fluid. Warm water injections are also called for, and should be regularly used.

The subsequent treatment of this disease is frequently the most perplexing. The discharge of discoloured urine may continue, and depression become very great. Under these circumstances, stimulants must be used judiciously and alternately with astringents, in order to check the passage of blood material through the kidneys. It also happens in some instances that the animals are not seen until the urine has acquired a dark or black colour, and prostration is fast approaching. The subjoined form may be adopted :

RECIPE NO. 30.

Take of aromatic spirits of ammonia	2 or 3 oz.
Powdered opium	1 dram.
Catechu	2 „

Mix, and administer in cold ale or porter. In three hours the same quantity of ammonia may be given in the ale, omitting the other ingredients ; but at the expiration of six hours the whole of the dose will be required.

The alternation of astringents with stimulants must be carried out in accordance with circumstances ; but in all cases when the purgative could not be administered at the outset on account of the general weakness, it is advisable to administer it as soon as possible after the return of strength will admit. For this purpose from one to two pints of linseed oil may be given, and with which stimulants may be administered.

For further formulæ for astringent medicines the reader is directed to consult the article on “Traumatic Hæmaturia.” In some instances, sulphuric acid proves highly beneficial, and may be given in the following proportions :

RECIPE NO. 31.

Take of sulphuric acid	1 to 2 drs.
Tincture of cardamoms	2 oz.
Infusion of quassia	$\frac{1}{2}$ pt.
Water	$1\frac{1}{2}$ „

Mix : to be given morning and evening.

The skin of cattle should be cleansed by frequent brushing, alternate sponging, and drying with friction, and clothing. The Roman bath is valuable when practicable.

As soon as the bowels will admit and the discharge of urine corrected, tonics are required in order to create a more active assimilation.

RECIPE NO. 32.

Take of solution of perchloride of iron	$\frac{1}{2}$ dram.
Infusion of quassia	$\frac{1}{2}$ pt.
Essence of ginger	$\frac{1}{2}$ oz.

Mix, and administer morning and evening.

In all cases a change of diet is absolutely necessary, which must be supplied in a digestible form and in small and repeated quantities. When the animals are housed, scrupulous cleanliness and ventilation must be attended to. The best drink throughout is large quantities of linseed-tea, and with which the medicines may be copiously mixed for administration.—*Ed.*]

MALIGNANT SORE THROAT.

[This affection is known as *Œdema glottidis*, and observed as a fatal disease among cattle and pigs. In the latter it is known as Quinsy.

Nature.—Malignant sore throat consists of a rapid effusion among the tissues composing and surrounding the entrance to the windpipe (glottis) in which life is jeopardised by interfering with respiration.



FIG. 25.

Symptoms.—These usually comprise those already enumerated under "simple catarrh," to which are added others of great urgency, as great difficulty of breathing, which borders on suffocation as the disease advances: the swelling, at first internal, soon manifests itself in the parotid glands upon each side of the throat, beneath the ear (Fig. 25), and which assume great dimensions. The pulse becomes rapid, numbering upwards of one hundred beats, and is soon small and feeble.

The membranes of the nose and eyes assume a dark crimson colour, breath is foetid and eventually intolerable, countenance haggard, mouth open, tongue protruded; and thus gasping for breath, falls, suffocates, and dies. A convulsive cough is frequently present, and the membrane of the mouth and tongue quickly covered with purple spots, the epithelium is thrown off, and parts are apt to become gangrenous. In pigs the swelling frequently extends to the fore extremities, and a stiff gait, with dulness and loss of appetite, are manifested in the first stages.

Post mortem Appearances.—The mouth, together with the larynx and pharynx, tongue, &c., are swollen, and their surfaces covered by ulcerated spots and discharges of a putrid nature. The salivary glands are considerably enlarged, and throughout their structure, as well as the contiguous tissues, a great amount of effusion has taken place. The brain and *medulla oblongata* are also more or less affected, and the lungs congested.

The duration of the disease may vary from a few hours to three or four days.

Treatment.—In the early stages, during constipation, laxatives are needed, when the formula No. 12, page 54 may be used. During diarrhœa the draught No. 11, page 51 should be given. The mineral acids are of great value in this affection, and should follow the above at regular intervals. Recipes Nos. 18, 19, 20, pp. 65, 68, 69, with their directions, as given under “*purpura hæmorrhagica*,” may be adopted.

At later periods, when the symptoms are urgent, tracheotomy must be performed at once to prevent suffocation, and a tube inserted in the windpipe. It is effected as follows :

The animal is secured by an assistant, who takes charge of the head, and holds it in such a position that the nose is extended and lower side of the neck put on the stretch. Towards the upper part, where the windpipe is found to be most superficial, a longitudinal incision, about two inches long, is made through the skin, dividing the muscles, and exposing the trachea

or windpipe. A tenaculum is then pushed through the intercartilaginous tissue uniting the rings at a central point, and by



FIG. 26.—*Tenaculum.*



FIG. 27.—*Scalpel.*

means of a scalpel, sufficient is cut out to admit of the introduction of a curved tube, as seen in the engraving. A strap put round the neck secures the tube in its place, but some practitioners use one that is self-adjusting. Each day it must be removed and the parts cleaned, an antiseptic



FIG. 28.

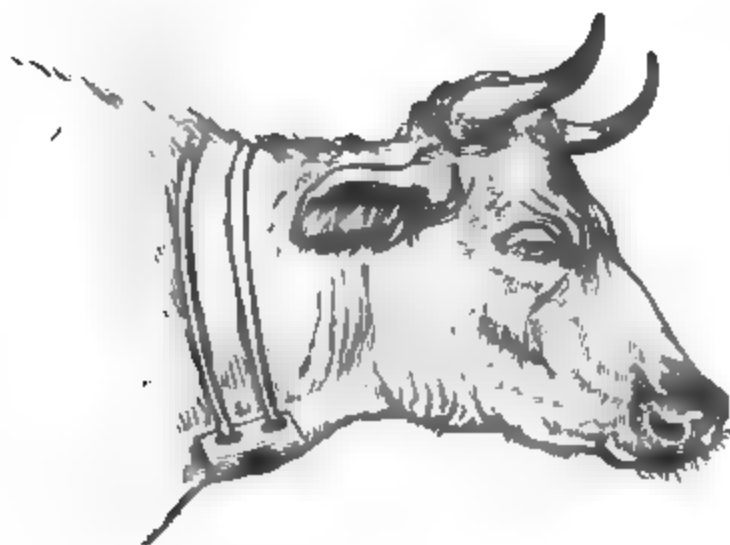


FIG. 29.

lotion being used for the purpose of destroying fœtor. Condyl's Fluid will be found to answer most purposes.

It is not unlikely that, even after relief is obtained by opening the windpipe, the inability to swallow will totally prevent the administration of medicines. The practitioner will then endeavour to act by means of what is known as the endermic method; that is, by injecting the remedy beneath the skin by means of a syringe armed with a hollow needle, as shown in

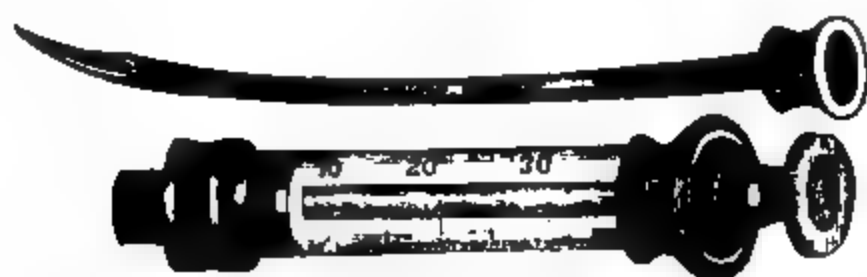


FIG. 30.

the annexed woodcut. It may also be required to inject them at once into the circulation, when for that purpose the jugular



FIGS. 31 AND 32.

vein is opened, and a glass syringe is made use of, as shown in Fig. 18. A more serviceable instrument is given in Figs. 31

and 32. It consists of a funnel provided with a stilette or stop-cock, to prevent the passage of fluid until the desired time. At the lower end a piece of flexible tubing about a foot long is fixed, and this terminates in a thin ivory or bone pipe three inches long. The vein is opened, and the ivory tube inserted *downwards*; the tube is supplied with the required medicine, and on turning the stop-cock or withdrawing the plug or stilette—which must be carefully done—the fluid runs into the vein.

The precautions necessary to be observed are: the fluids should be at the temperature of the blood, 99° F.; they must be very dilute, and not administered in too large quantities at once; all solid particles must be scrupulously avoided, as by passage to the lungs they may produce rapid congestion of those organs.

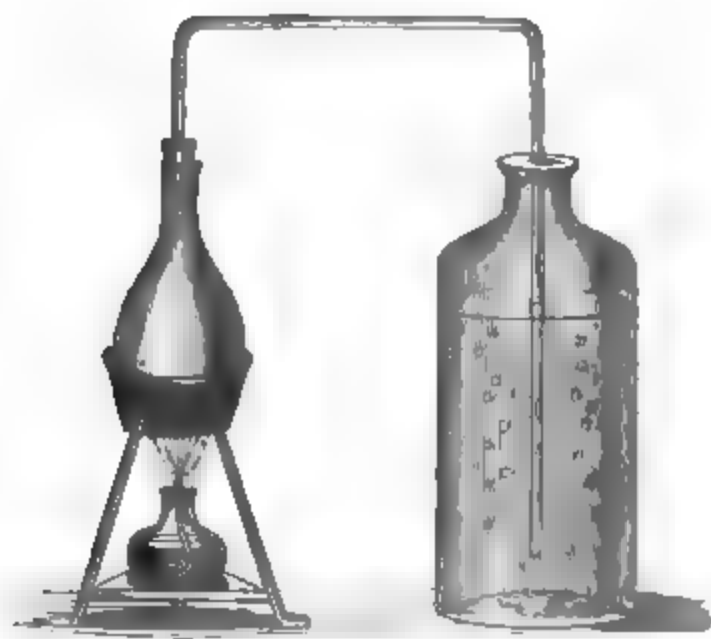


FIG. 33.

The mouth will require attention, and in order to reduce the swelling and correct the tendency to early ulceration and gangrene, solutions of chlorine gas in water may be used. For the description of the annexed wood engraving, and the process for making the solution, see page 211. Condyl's Fluid may be injected by means of a syringe, or the wash No. 43, page 163.

As soon as the creature can swallow, medicines may be given by the mouth, but the greatest care is required. Food must be good and easily digested ; sound corn should be boiled, as barley, malt, peas, &c. Oatmeal, barley-meal, ground malt, &c., in the form of gruel, and hay-tea are serviceable fluids. The action of the skin should be promoted by friction and clothing, and domestic comfort of every kind furnished by the proprietor.

The flesh and blood of animals dying from maglignant sore throat are very poisonous to others that partake of them. Horses, dogs, and pigs, supplied with either uncooked, have rapidly succumbed to putrid fever, with great swelling about the fauces. Butchers and others skinning and cutting up carcasses affected with this form of blood disease, require to exercise caution if raw surfaces are upon their hands or arms. The safest plan is to bury deeply the whole body without taking off the skin, the opinion of a veterinary surgeon being obtained to certify the disease from the outset if possible.—*Ed.*]

II.—BLOOD DISEASES OF DOUBTFUL EXISTENCE SUPPOSED TO ARISE FROM ANIMAL POISONS OF UNKNOWN ORIGIN, viz. :

MEASLES.

SCARLATINA.

MEASLES.

[Under this name several diseases of swine and other animals are included without due regard to their nature or causes. Hog cholera, and a parasitic disease known as *cysticerci cellulosa*, are frequently confounded with true measles, as well as any affection in which the skin exhibits a morbid eruption.

Very little is known with regard to this malady. It has only been hitherto described by continental veterinarians, and no evidence is forthcoming showing its existence in this country. As noticed abroad, it consists of irritative fever, with catarrhal symptoms, swelling of the head and throat, constipation, loss of appetite, &c., &c. An irregular eruption appeared about the second or third day, which was confined to the insides of the thighs, sides of the body, face, chest, &c., and consisted of a perceptible elevation, the redness of which disappeared on pressure. In the centre a perceptible hardness was evident. After the further expiration of another day, a papulous eruption took place from the central points of hardness, and gradually, in two or three days more, the acute signs were allayed, the spots became brown, the cuticle peeled off, and perfect subsidence took place by the ninth or eleventh day, unless colic

and diarrhœa set in. A peculiar odour of the skin was observed in the earlier stages. Sheep were attacked, and the discharge from the nose was sufficient to produce the disease in others.

Pigs are also liable, and exhibit similar signs, with vomiting.

Treatment.—If measles—or rubeola, by which term it is also known—should be detected in this country, complete segregation should be carried out. The bowels require attention, and the use of mild doses of salines are useful. The action of the skin should be promoted, and all sanitary as well as domestic attention conceded.—*Ed.*]

SCARLATINA—SCARLET FEVER.

[This disease, common to the human subject, is somewhat of doubtful occurrence in the lower animals. It is, however, claimed as appearing among them, and by no less an authority than the late John Barlow, an eminent teacher of cattle pathology in his day, by whom it was described in his lectures as occurring among horses and cattle. There are, however, many difficulties in the way of an universal acknowledgment of the existence of true scarlatina and measles among cattle, sheep, and pigs, a fact which silently yet forcibly points out the absolute necessity for a continued and precise mode of observation.

Scarlatina consists of an acute inflammation of the skin and mucous surfaces, associated, in the human subject, with fever of an infectious and contagious character. Ordinary fever is precursory to the general period of attack, which takes place at variable periods between the second and tenth day of what may be termed an incubatory stage. In forty-eight hours an eruption of minute spots is seen, which form patches having a bright scarlet colour. The mucous membranes of the eyes, nose, and fauces exhibit these appearances; but, unlike measles, it produces no soreness of throat or catarrhal symptoms. A

peculiar odour—said to be like old cheese—is exhaled from the skin, and the eruption, in favourable cases, terminates about the seventh day.

A professional friend of the Editor, Mr. Charles Hunting, M.R.C.V.S. South Hetton, relates the occurrence of the disease in his practice among ponies employed in the collieries under his care. Others, also, have described the affection, but no evidence has been given of its contagious character. The late John Barlow said in his lectures, “When it occurs in cows, peeling of the cuticle is not always observed, and it generally follows influenza in the autumn. The local signs are present in all parts covered with thin skin and having a scarcity of hair, as the nose, axilla, udder, &c., &c. At first a yellow tinge is observed ; but as the disease advances, it merges into a blood colour. Where there is much cellular tissue, the parts swell ; but the skin does not become thicker, nor is there any pain on pressure ; pitting, however, is observed under the fingers.”

He refers, also, to the state of constipation that generally ensues, and the presence of albumen in the urine, and urges particular attention to sanitary and domestic care during the existence of the disease.

It is possible that in the lower animals such modifications occur as to present variable appearances in diseases which may partake of the general characters of the questioned forms of rubeola and scarlatina. Among many practitioners the existence of such a disease as malignant catarrh is questioned, but a number of forms of disease is tolerated under the ambiguous term “influenza,” and the same flows as glibly as ever across the lecture-table of certain teaching institutions. With such looseness we cannot feel surprised that observation is at a discount.—*Ed.*]

III.—BLOOD DISEASES ARISING FROM ANIMAL POISONS HAVING AN INDIGENOUS ORIGIN, NON-CONTAGIOUS, BUT PRODUCTIVE OF A SEPTIC OR FATAL PUTRID FEVER IN OTHER ANIMALS, viz. :

ENZOÖTIC DISEASES.

A.—ANTHRAX OR CARBUNCULAR FEVERS:

1. CARBUNCULAR ERYSIPELAS.
2. SPLENIC APOPLEXY.
3. BRAXY IN SHEEP.
4. GLOSS-ANTHRAX OR BLAIN.
5. HOG CHOLERA.
6. APOPLEXY IN PIGS.

B.—ANTHRACOID DISEASES:

7. PARTURIENT APOPLEXY IN COWS.
8. AFTER-PAINS IN EWES.
9. RED WATER IN SHEEP AND LAMBS.
10. BLOOD DISEASE OF LAMBS—NAVEL-ILL.

ENZOÖTIC DISEASES.

[Among the blood diseases of horned cattle and sheep enzoötic diseases are the most extensive and important. The term is derived from the Greek *εν* (*in*), and *ζωον* (*zoön*) an animal, and is generally employed in preference to that of *endemic*, to denote more correctly not only the subject in which they appear, but also with greater regard to the nature and character of the affections themselves.

Causes.—These are of two kinds, viz. :

1. *Natural Causes.*—Peculiarity of natural or indigenous vegetation ; position of land, as forming parts of prolific hills or fertile valleys ; geological formation, as determining an excessive richness, poverty, dryness, or moisture of soil, particularly if these extremes alternate with each other upon the same farm or estate.

2. *Artificial Causes.*—Mode of culture, as forcing land to produce crops without first giving compensating return in the shape of tillage and manure ; over-stocking, *i.e.*, grazing, rearing, and breeding a greater number of animals than the land can properly support ; incautious use of artificial and highly nutritious foods, combined with a want of sufficient exercise, more especially when animals are in low condition or transferred suddenly from poor food or pasture.

The natural causes present great difficulties in their removal, but the artificial causes are counteracted readily and with greater certainty.

Enzoötic diseases are *not contagious*, but under certain conditions they may be propagated by inoculation among warm-blooded animals. Next to epizoötic or contagious diseases, they may be ranked in their destructive characters, often impoverishing whole breeding and rearing districts, and bringing farmers to the verge of ruin, if the exciting causes are not counteracted. In a lecture recently delivered by the Editor, before the South Devon and Cornwall Chamber of Agriculture, the following passage occurs in reference to the question :

“ Before we quit this portion of our subject, it will not be uninteresting to note how the prevalence of disease has had its effects upon our agricultural population, as evidenced by the published statements of the Royal Agricultural Benevolent Institution. Having acted for some time as local honorary secretary, numerous applications have been made to me for influence, and I have been struck with the great number of

instances in which the cause of failure, among others, has been attributed to 'losses among stock.' As far as I have been able to estimate, these have amounted to two-thirds of the whole number. But on referring to the list of subscriptions and donations issued during the past year, we find a closer approximation to fact. It is there stated that sixty-eight candidates are admitted to the benefits of the institution, and the causes of their failure are stated as follows :

' From losses in stock, &c.....	27
„ heavy losses in farming	20
„ various misfortunes.....	21
Total.....	68.' ”

Mr. Alderman Mechi says : “ Look at the cause of distress assigned by the hundred and fifty decayed farmers who are now candidates for relief from our Agricultural Benevolent Institution. In almost every case 'losses by stock' are assigned as the prominent cause of failure. Within my own knowledge and neighbourhood, I might quote numerous cases.”

The losses among stock throughout Great Britain are truly marvellous, and, notwithstanding very close estimates have been made, the great desire to keep matters secret has tempted the powers in high places to deny the truth. While farmers have suffered from enzoötic diseases, and in the end become ruined, free trade opened up the portals of the nation to the admission of more formidable maladies, and, where the first failed to produce destruction of peace and property, the second faithfully succeeded in both. The odium which has constantly attached itself to places where disease appears among stock prompted an amount of secrecy than which nothing has proved more direful to the agriculturist. It prompted a system of wholesale drugging which profited nobody but the quack. It offered no opportunity for a scientific discrimination, by which preventive measures might have been instituted, and saved thousands of animals as well as millions of pounds. What is

also lamentable, little or no information was gained by which the storms of the future should be repelled. Veterinary science in Britain was but little resorted to, and, even where it was, doubtless in too many instances the bigotry and imperfect teaching of the past failed to convince the professors that even a shadow of doubt could be placed upon their judgment and proceedings. Much of this was, however, pardonable, and has been productive of great benefit. There is an intense desire to profit by the failures of the past, and it is to be hoped that the agitation which is now being made in various quarters of the kingdom will culminate in the adoption of measures which shall establish a security unknown during the past thirty years.

As observed in this country, enzoötic affections are of two kinds, viz., *anthrax* or *carbuncular fevers*, and *anthracoid diseases*, or those possessing the greatest resemblance, as well in nature and cause, to anthrax itself, yet having distinctive characters.

Nature.—Enzoötic affections depend upon the production of an unnatural and dangerous plethora, which determines morbid, physical, and physiological changes in the constitution of the blood, and the subsequent development, in certain instances, of a specific animal poison therein. In all there is a remarkable tendency to passive hæmorrhages, which in true anthrax are more or less complicated with erysipelas, phlegmons, boils or carbuncles, and gangrenous states.

I.—ANTHRAX OR CARBUNCULAR FEVERS.

- I. CARBUNCULAR ERYSIPELAS (*Erysipelas carbunculosum*),
Anthrax of the Extremities: known in the vernacular as *Black Quarter*, *Quarter-Evil*, *Quarter-Ill*, *Joint-Ill*, *Black Leg*, *Speed*, *Hasty*, *Puck*, *Shewt* or *Shoot of Blood*. *Inflammatory Fever* of Youatt; *Milzbrand emphysem* of the Germans; *Charbon* of the French.

The late Author, in his original edition of this work, thus wrote in reference to this affection :

“ This disease is called by a great number of other names ; but as they all indicate the same disorder, it would be of no advantage to the reader here to repeat them.

“ The symptoms are in many respects similar to those of the *murrain* or pestilential fever, described in page 138. It is, however, highly necessary to discuss this malady in a separate section, as it does not appear to be either infectious or epidemic, but is almost wholly confined to young cattle from one to two years old. The quarter-evil chiefly affects such as are in the best condition. Milch cows, or lean cattle of all descriptions, are seldom seized with this disease, and during the winter it is not known. The summer season is the time when it makes its appearance, and very often proves destructive to great numbers of young cattle in different parts of the kingdom. When the vegetable creation springs up in all its perfection, the young animals are not able to stand against such luxurious living, particularly those which have been much reduced by bad keeping and scanty food during a long and severe winter.

“ The *cause* proceeds from a redundance or overflowing of the blood, which is very great, and frequently occasions them to drop and die suddenly in a state of putrefaction.

“ The *symptoms* are a sudden depression of the whole animal frame, as if seized or struck with the palsy. A swelling takes place immediately in some part of the body, as on the legs, shoulders, under the belly, or on some part of the back : when it is on this last part towards the loins, it will be attended with the most danger. It is first discovered by the crackling noise made by the swelling when the hand is pressed upon it, and owing to a quantity of air being collected between the skin and flesh. The mouth and tongue are full of blisters from the violence of the fever.”

[Carbuncular erysipelas is very common among calves throughout Britain. It is the “ Black Spauld ” of young sheep. It rarely appears in animals of mature age, the system being

then proof against the morbid conditions which produce anthrax.

Nature.—Extensive sub-cutaneous extravasation, as well as general infiltration of blood and lymph beneath the skin, &c., and ecchymosis as a result of blood poison.

Symptoms.—All the forms of anthrax are remarkable for the paucity of premonitory signs, except as far as the condition of plethora is concerned. Usually, the first intimation is the discovery of one or more dead carcasses in early morning. When opportunities for observation occur, the signs are as follow: Costiveness, frequently attended with bloody stools (*proctorrhæa*); deficient and highly-coloured urine, slight excitement, protruding eyes, and injected visible membranes; hot mouth, slight frequency and fulness of the pulse, and accelerated respiration. These constitute the *first stage*, and are seldom noticed.



FIG. 34.—*Carbuncular Erysipelas*—*Black Leg or Quarter ill.*

Second stage.—Lameness or stiffness is now added to the previous signs. Respiration and circulation are notably disturbed, the pulse being full and rapid. The head and neck are protruded, eyes bloodshot, appetite lost, intense thirst, urine darker in colour, and the creature stands gloomily away from all his companions. Lameness increases every hour; other signs also rapidly suffer aggravation, and the animal utters low moans, particularly when disturbed. Diffused emphysematous swellings (containing air) appear upon the sides,

quarters, or extremities, which crepitate, or crackle like tissue-paper, when the hands are passed over them.

Third stage.—The power of standing is lost, breathing difficult, pulse small, feeble, or imperceptible; swellings have increased, and the sufferer lies upon one side with outstretched neck, stomach painfully distended with gas (*hoven*), tongue protruded, eyeballs retracted and covered by the haw (*membrana nictitans*).^{*} The ears, horns, and extremities are cold, and insensibility (*coma*) and death speedily follow, the whole train of symptoms frequently terminating within twelve hours.

In protracted cases the animal continues for several days, when opportunity is thus given for the swollen parts to slough extensively, and smaller spots to appear on the tongue; buccal and other membranes, which at first form apparent blisters, and afterwards slough, exhibiting very tardy healing powers.

Post mortem Appearances.—Emphysema (air) in all available spaces, as beneath the skin and membranes, between muscles and in all closed cavities, as a result of early and rapid putrefaction, by which the abdomen is greatly distended. Black exudations of blood form extensive patches, which may be confined to one limb or quarter. Similar exudation also occurs between muscles which are more or less gangrenous, and the vessels of the locality in a state of extreme turgescence; the blood, however, being dark and fluid. The lungs are congested, one, the lowest, being always the worst; frothy mucous almost fills the bronchial tubes, extensive ecchymosis covers the serous membranes, and free transudation occurs beneath this covering in many organs; the heart is soft, flabby, and filled with blood that is black and semi-fluid, and numerous blood-stains are seen, formerly believed to be an evidence of inflammation. Cadaveric rigidity is slight, and observed only immediately after death.

Treatment.—The great secret in diseases of this kind is to

^{*} See Fig. 201, page 586.

limit or destroy the power of the operating cause. The Author in the original work makes the following pertinent remarks in reference to this portion of the subject :]

“It will now be proper to lay before the reader a few observations, worthy of notice, respecting the prevention of this malady in those districts where it is accustomed to appear. Every possible precaution cannot be too strictly adhered to in preventing so destructive a disease among young cattle, for, if once attacked, their cure may be doubtful. Such as thrive most are in general first attacked, and in the greatest danger. As soon as this disease makes its appearance upon any one of the herd, while in the pasture, let them all be brought out in the evening into a fold-yard, when from two to three quarts of blood may be taken from each, according to its size, condition, and strength. Let them be kept there till next morning, and then give to each beast one of the following drinks :

RECIPE NO. 33.

“Take of crude antimony in powder.....	$\frac{1}{2}$ oz.
Brown sugar candy, and nitre in powder, of each.....	1 „
Myrrh, in powder.....	$\frac{1}{4}$ „
Flowers of sulphur	2 „

“Mix for one drink. This drink must be given fasting in the morning, in a quart of warm gruel; two hours after the beasts may be turned into the pasture. Or the following may be given, if thought more proper :

RECIPE NO. 34.

“Take of nitre and madder, of each in powder	1 oz.
Alum in powder and flowers of sulphur, of each.....	2 „
Treacle, table-spoonfuls	4

“Mix for one drink. This must be given in a quart of warm gruel and a wine-glass-full of common gin added to it. Two or three of these drinks, with bleeding, are in general deemed sufficient to protect them against the future approach of this disease, if given every third morning. By adhering to the

treatment laid down as above, the disease may not only be cured, but its ravages may also be prevented."

[Setons are of great service in the dewlap while they cause a discharge of pus. Young thriving stock should receive occasional laxatives, or nitre in half or one-ounce doses each week while the disease is rife. One of the great causes is undrained land, which is evident in the disappearance of the disease when improvement is made in that direction. Young stock should receive additions of oil-cake to their food at much earlier periods of their youth than is usually practised in many districts, and sudden changes from poor food or pasture to rich aliment of any kind is to be severely condemned.

When the mouth is sore or blisters form, the latter may be opened by a lancet, and the parts should be dressed, washing them two or three times a day with such a mixture as the following :

RECIPE NO. 35.

Take of alum in fine powder.....	2 oz.
Sulphuric acid	2 drs.
Tincture of myrrh	2 oz.
Water	1 qt.

Mix the powder and water together, and add the acid when dissolved ; then put in the tincture, when it is ready for use.

Abscesses require opening as soon as pointing appears, and the resulting wound, together with all ulcers, must be kept scrupulously clean, the most suitable dressing being the following :

RECIPE NO. 36.

Take of pure carbolic acid	2 drs.
Pure glycerine	1 oz.

Mix and dissolve, then add

Carbonate of soda	$\frac{1}{2}$ oz.
Water	10 fluid oz.

The mixture is then ready for use.

A common remedy employed by the cow-leech, as a pre-

ventive and even cure of "black quarter," is the operation of nerving (?) For the practice of this imposture, hundreds of pounds are annually drawn from the pockets of agriculturists. The effects derivable are no better than those from a common seton, the *modus operandi* of which can be understood more readily. The so-called operation consists of casting the animal and securing the limbs in succession to an iron bar driven into the ground, and, after an incision has been made above the cleft of the hoof, either a vein or part of a ligament is cut out, and this is by some termed a worm and by others a nerve. Plethoric animals thus punished will not move about much from the pain they suffer, they therefore get no food and are reduced—the whole secret of the proceeding. A seton placed in the dewlap, of sufficient length from above downwards, with change of pasture and medicines when required, is not only the most rational treatment, but an honest one. It professes no more than it effects, and by it the owner is not made a dupe by the so-called "worming" and "nerving" operation in parts where such structures are not found; particularly by such a clumsy mode of dissection with hands untutored and unsteady.—*Ed.*]

2. SPLENIC APOPLEXY (*Apoplexia splenitis*); *Blood-striking* in the vernacular; *Milzbrand* of the Germans; *Sang-de-rate* or *Maladie-du-sang* of the French.

[This affection is common to cattle and sheep, but most frequently seen in the former when put up to fatten.

Nature.—Not well understood. There is an undoubted blood poison or fermentive action induced within the blood itself, which some pathologists have asserted depends upon the presence of animalcules called *bacteriæ*; others, with probably greater justice, believe the cause to be an unnatural plethora, developed from excess of nutritious food consumed when the

animals are kept under close confinement. The local manifestations are extensive congestions and extravasation of blood within the structure of the spleen or milt, frequently attended with rupture of the investing capsule, and general ecchymosis of visceral membranes. The immediate cause of death is most probably an abrupt impairment of nervous functions.

Symptoms.—Premonitory signs are few and frequently unobserved. Animals are supposed to be in perfect health at night, but one or more are found dead next morning.



FIG. 35.—*The common subject of Splenic Apoplexy.*

First stage.—Excitement, prominent eyes, visible membranes reddened, mouth hot and dry, urine and fœces deficient and often mixed with blood, pulse somewhat rapid and hard.

Second stage.—Uneasiness, colicky pains, pulse more frequent, smaller, and harder, respiration accelerated and short, back arched, and the animal seeks support by leaning against the nearest object.

Third stage.—Respiration short and roaring or stertorous, pulse small, feeble, and more or less indistinct or imperceptible; the animal drops and is seized with convulsions; red froth and mucous escape from the nostrils; he struggles violently, bellows, and moans; general coldness comes on, and death ensues in periods varying from two to twenty-four hours.

Post mortem Appearances.—Early and rapid decomposition, cadaveric rigidity transient, abdomen and areolar (or cellular)

tissue beneath the skin distended by gaseous emanations ; subcutaneous infiltrations of blood ; much serum, sometimes blood also, is found within the abdominal cavity ; spleen enlarged or ruptured, and weighing in the ox 10 to 15 lb. (proper weight, 2 to 3 lb.), in the sheep 12 to 20 oz. (in health, 2 or 3 oz.) ; extravasation of blood more or less throughout the intestines, and the fourth compartment of the stomach (*abomasum*) is highly coloured ; blood-stains are frequent, and ecchymosis pervades the whole serous membranes, and even the substance of the organs they invest. The pericardium (heart-bag), membranes of the brain (particularly the arachnoid), with the ventricles, contain an excess of fluid ; the bladder is full, and blood-stains appear upon the outer part, with ecchymosed spots.

Treatment.—The remarks that have been made in reference to the treatment of black quarter apply very much to this affection. Numbers of animals die notwithstanding the treatment adopted at the late stage in which the veterinary surgeon sees the case. Whenever the disease appears, he should be consulted with regard to prevention, which would prove a highly profitable proceeding in many localities. When, however, there is time for remedial treatment, it should be commenced by dashing cold water over the head, and administering immediately a full dose of purgative medicine, according to the size of the animal, after the following form :

RECIPE NO. 37.

Take of Epsom salts.....	24 or 30 oz.
Calomel.....	2 drs.
Ground ginger.....	2 oz.
Treacle	1 lb.
Alc.....	1 qt.

Mix.

If the vital powers appear flagging, strong doses of the carbonate of ammonia should be given every two hours. Four drams may be pounded and dissolved in a pint and a half of

cold ale, to which also a table-spoonful of ground ginger should be added. In the first stage, while excitement is present, bleeding will be useful, particularly if supplemented by purgatives. Animals affected beyond this point are usually irrecoverable. The flesh of those dying from splenic apoplexy is unfit for human food. Dogs and pigs feeding upon it have died within a few hours in consequence of putrid disease being set up, and butchers have died after receiving cuts or scratches in dressing the carcasses.—*Ed.*]

3.—BRAXY.

[The affection so termed is known only among sheep.

Nature.—A blood disorder, with remarkable tendency to coagulation within the blood-vessels, thus leading to a direct, extensive, and fatal arrest of the circulation. It is *not* an inflammatory disease, nor does it appear that the pure anthrax poison is developed, as the frequent consumption of braxy hams in Scotland suggests. The victims are those animals in a vigorous condition, and are usually found dead after clear moonlight nights or on cold frosty mornings.

Symptoms.—As in the blood diseases already described, there are in this but few signs that indicate the fatal consequences that ensue. Those which have been noticed are blood-shot eyes, accompanied by a strange and excited appearance; full and rapid pulse; accelerated respiration; hot mouth, limbs, and body; costive bowels; urine deficient and highly coloured; with a peculiar staggering gait.

The shepherd recognizes two forms: these, described in his usual phraseology, consist of *Dry Braxy*, and *Dumb* or *Water Braxy*, which are decided by the presence of constipation or diarrhoea.

In later stages there may be observed pain and straining to void fœces; the wool is “clapped” to the skin, and has lost

its peculiar soft and unctuous feel; the heart throbs; colicky pains ensue, with rapid insensibility, during which the animal falls, struggles, and dies. Not unfrequently the creature rolls into a ditch, and the cause of death is thought to be drowning; but the advent of other deaths go far to prove how valuable would have been a careful *post mortem* examination under the direction of a veterinary surgeon.

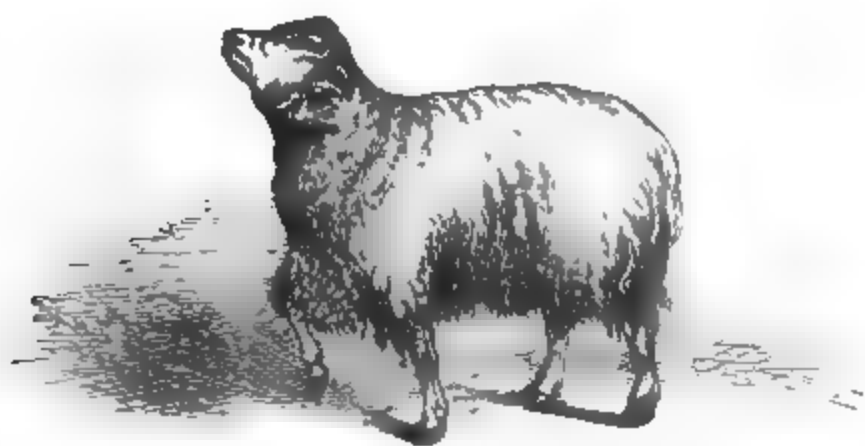


FIG. 36.—*Sheep in the last stage of Braxy.*

Some cases are characterized by lingering fever, in which most of the acute symptoms are absent. Putrefaction sets in before death. When diarrhœa is present, the paunch swells as seen on the left side; with constipation, the gaseous distension is chiefly sub-cutaneous, *i.e.*, located beneath the skin, when pressure produces the characteristic crepitus or crackling.

Post mortem Appearances.—All the manifestations of rapid decomposition are present; foetid emanations escape from all parts as soon as severed; bloody froth issues from the nose and trachea; blood-vessels contain black blood; the superficial tissues are stained of a reddish-yellow colour; ecchymosis and blood-stains are visible upon and in most organs, and a red serum is present in the abdominal cavity; circumscribed extravasations prevail beneath the mucous coat of the intestines; the third stomach (*omasum*) is usually impacted; lungs con-

gested ; heart full of partly coagulated and dark blood, and is ecchymosed and blood-stained within and without.

Treatment.—Successful management of sheep stock, and their protection from braxy, is entirely a system of prevention. Hill stock should, if possible, receive a greater amount of shelter, and thriving animals be confined to the fold or a bare pasture during moonlight nights, and thus prevent their roaming and devouring too much food. These are, however, directions that are much easier to intimate than to observe and carry out. Another point of interest is to decide how medicines can be administered to large flocks that are feeding upon the lonely hills of distant counties and suffering from braxy.



FIG. 37.—*The Facial Vein where Bleeding is sometimes performed.*
The current of Blood is arrested by pressure on the lower border of the Jaw at *a*.

Among the flocks of the more accessible regions affairs assume a less difficult character. They can be supplied with shelter unknown in the hilly districts of North Britain, where death from such a cause is most common ; they can also be supplied with a change of pasture, or folded properly at required times, and induced to accept a change of food in which suitable medicaments—as preventive means—are placed. Even here, however, the rapid nature of the disease sometimes renders ordinary treatment of little moment. Animals are noticed too late. Preventive measures are not sufficiently studied and appreciated. Rapidly thriving sheep are destitute of the ne-

cessary amount of vigilance which their value demands, and hence the disasters that yearly occur.

When cases are observed at the earliest stages, the sheep should be driven rapidly for a short distance—say fifty or one hundred yards—and immediately bled. The spot selected is the facial or jugular veins, and, as recommended by some, the vein upon the inner side of the thigh. The face offers a most convenient spot, having the least amount of wool upon it. The vein is also readily distended by pressure on the lower border of jaw at the place indicated at *a* in Fig. 37, and should be opened by the lancet between that part and the bony ridge on the side of the face.

Purgatives are absolutely indispensable, and for full-grown animals four or six ounces of Epsom or Glauber's Salts will be required, and gentian and ginger in half-ounce doses should also be added, and the whole administered as speedily as possible in warm ale and treacle. Injections of warm water, soap and water, &c., are of great service in unloading the bowels and promoting their action. The proper performance of the digestive functions is imperatively called for, and little hope of success will be certain unless this is attempted in the earliest principles of treatment. For a time subsequently a less nutritious diet must be allowed, and an excellent practice consists in the administration of nitre, about fifteen or twenty grains to each animal daily. This is conveniently accomplished by mixing it with bran, pulverized oil-cake, &c. Sudden changes from poor to rich pastures should be avoided as far as possible, and the allowance of grain or artificial foods continued or commenced with great circumspection.—*Ed.*]

- 4 GLOSS-ANTHRAX OR BLAIN: *Zungen-krebs* or *Zungen-karbunkel* of the Germans. It is the "*Hawks*," and "*Gargis*," or "*Gargyse*," of some districts.

[*Nature*.—One of the varieties of anthrax fever usually con-

finer to cattle, but witnessed occasionally among sheep, in which the local manifestations are rapid swelling with development of pustules and malignant carbuncle, in which the mouth generally suffers. It is *not* contagious in the sense conveyed by Youatt; but if the poison of the disease is introduced to the circulation of healthy animals, a rapid and fatal putrid fever is engendered, destitute, however, of the local characters of "blain or gloss-anthrax." The attendants of animals suffering from this malady are cautioned to exercise great care. They must scrupulously avoid their mixing with others that are healthy. Wounds and raw surfaces generally that exist upon their own hands or parts that may be exposed should be carefully protected. The saliva is *poisoned* by the disease at a certain stage, and this entering the body by food or a wound may cause an untimely and agonizingly rapid death.

Symptoms.—Gloss-anthrax is as remarkable as all other forms of anthrax fever in its power of appearing without first exhibiting peculiar and noticeable signs of disturbance. It is frequently contemporaneous with *epizoötic aphtha*. There are extreme signs of constitutional disturbance, which quickly succeed to great depression, coma (insensibility), and death. From the mouth at first issues a copious limpid saliva, which speedily becomes purulent and bloody by the bursting of pustules that have formed upon the upper and wider parts of the tongue and sides of the mouth. These are of a white colour at the commencement, but soon become purple and even black, and by discharge of their contents expose a foul ulcer, having slow and feeble healing powers.

The nose, face, neck, and contiguous parts are involved in a rapid congestion and swelling; pressure is then induced upon the windpipe and jugular vein; respiration, therefore, becomes difficult and roaring (stertorous) and the animal becomes unconscious, and dies within twenty or thirty hours. The characters of the pulse are at first hard and rapid, but speedily become

feeble and indistinct, from the great obstruction placed on the circulation and the attendant train of effects.



FIG. 38.--*Gloss-Anthrax or Blain, early stages.*

Post mortem Appearances.—The general conditions observable after death are those of anthrax fever already noticed. Extravasations of blood among the tissues occur in every part of the body; smaller spots (ecchymosis) and blood-stains are frequent, with effusion of serum in the various cavities, and rapid decomposition. The local signs are considerable tumefaction and sloughing of the tongue and mouth, with more or less gangrene or mortification of the parts, and sub-cutaneous extravasation and infiltration (dropsy) about the head and neck.

Treatment.—The remarks already given under “Anthrax Fever” (black quarter), as far as prevention and general treatment is concerned, apply well to this affection. Bleeding should be resorted to at the earliest stages, and 1 lb. of Epsom salts, with ginger and gentian, 2 oz. each, mixed with a quart of warm ale and 1 lb. of treacle, administered immediately. The animal should be placed by himself in a cool comfortable shed away from all other animals, and special attendants drafted to wait upon him. Food cannot be taken, but nutritious drinks may be given, as linseed-tea, barley-water, flour or oatmeal gruel, hay-

tea, &c., &c., should be at hand, in which a little nitre is dissolved.

The pustules within the mouth must be opened by means of a lancet or the hot iron. The latter is most favourable for promoting healthy action in the sloughing parts. Afterwards the mouth should be washed with the following mixture three times a day :

RECIPE No. 38.

Take powdered alum	2 oz.
Oil of vitriol	2 drs.
Honey	4 oz.
Water	2 qts.

Mix the first, second, and third ingredients together in an earthen vessel, and pour upon them the water. It is to be poured into the mouth when the head is held up, and, immediately releasing the animal as soon as a tea-cupful has been administered, the motion of the jaws that ensues causes the mixture to reach all parts of the mouth. Green food, roots, nutritious mashies of meal or boiled corn are required as soon as the animal is able to masticate. There are many remedies to be employed in this as in all other diseases, which the veterinary surgeon alone understands, and are not safely intrusted to others except for administration. They are not included here, as, in most instances, it is not possible to obtain them in many districts where this work may reach. The scientific veterinarian throws himself upon the resources of chemistry, and produces solutions of chlorine gas, sulphurous acid gas, &c., &c., which in his hands prove valuable remedies, the manufacture of which is not possible upon many farms and other places, and particularly when required at a short notice.

Blain has not been frequently noticed of late years. It has not, however, been banished from the country, as might be implied by the fact, but rather points to a practice by which animals are made away with, particularly in Ireland, where little or no veterinary skill is exercised among them.—*Ed.*]

ANTHRAX FEVER IN THE FIG.

[Two forms are common in Britain :

1. HOG CHOLERA.
2. APOPLEXY.

1. HOG CHOLERA: *Typhus, Anthrax, Gastro-enteritis, Erysipelas carbunculosum, Cyanosis*; in the vernacular, *Distemper in Pigs, Red Soldier, Blue Sickness, Blue Disease, Measles, &c.*

Nature.—This is much questioned. Some regard it as typhus, others as anthrax; hence the various appellations. It is without doubt a blood disease, and may be viewed as an anthrax form of fever, modified by habit and constitution of the animal; yet there are conditions that appear to negative this.

Symptoms.—Premonitory signs are late, or very transient, and seldom observed. Dulness, drooping head and ears, and loss of appetite may be observed in some cases during the *first stage*. These are seldom seen, as the animal isolates himself from the rest, and is buried beneath the straw, a heap of faggots, &c., and thus seeking quietness, often remains until he dies.



FIG. 39.

Second stage.—Abdominal pains are indicated by lying with forefeet outstretched, and the abdomen apposed to the ground, and, when caused to move, uttering shrieks. Sometimes the pigs run about as if wild, screaming or grunting in a very pain-

ful manner, at others they are dull and stupid. The skin assumes a purple colour (see plate), particularly over the abdomen, inside of the thighs, and upon the back and ears. If pressed, the colour disappears, except when blood material has already been effused, as occurs at a later period. Visible membranes partake of the discoloration, and sometimes an appearance of cutaneous eruption ensues. The pulse is rapid, but small and feeble, and sometimes violent sickness comes on.

Third stage.—Diarrhœa, which may have set in during the second stage, is now profuse, and the dejections are black and offensive. The pulse is sinking, becoming more rapid, smaller, and weaker, and at length is imperceptible; the breathing is spasmodic or catching, owing to the congestion of the lungs, and a painful irritating cough is present, which increases the general weakness; the animal can scarcely stand, the legs cross or plait with each other, and complete paralysis soon follows. Sloughing and ulceration now succeed the eruption on the skin, the animal becomes insensible, and dies in from three to six hours. Slight forms now and then appear, which consist of discoloration of the skin, and loss of appetite, extending over a day or two, and recovery follows; but these are not common.

Post mortem Appearances.—Besides the local condition of the skin, the appearances after death are closely allied to braxy in sheep.

Treatment.—Administer quickly in the first or second stages, *before diarrhœa sets in*, the following.

RECIPE NO. 39.

Take of Epsom salts.....	2 to 4 oz.
Sulphur.....	2 to 6 drs.
Gentian and ginger, in powder.....	1 to 2 drs.
Treacle	2 or 3 table-spoonfuls.
Warm ale	$\frac{1}{2}$ pt.

See directions for administering medicines to pigs, article "Drenches" in Appendix.



Princess Hilda, the 10

The action of the bowels should also be promoted by clysters, and the whole body sponged over with cold water, and, if it can be borne, smart friction by means of a flannel. Such sponging should not consist of throwing on a great quantity of water, but a careful and consistent damping of the whole skin. The friction also must be regulated by care, patience, and exercise of human feeling. Clean straw and comfortable styes are required, with low diet, vegetable food, and what is best, a bare pasture or a wander along the lanes or roads where little food can be got.

Preventive treatment consists of cautious feeding in young and growing animals, cleanliness, exercise, with a carefully regulated admixture of vegetables daily.—*Ed.*]

2. APOPLEXY IN PIGS.

[There are several forms described, but in all, doubtless, the causes, viz., plethora and confinement, &c., predominate in their production, although the specific blood poison of anthrax may not be developed. The prevailing diseases of pigs, to which the term apoplexy is applied, however, partake more of the true characters of anthrax than otherwise, particularly in young growing animals. *Symptoms* are few at the outset. Restlessness, bloodshot eyes, and variable appetite, with constipation and scanty excretions of dung and urine. As the animal eats he suddenly stops, reels, and falls down dead, a great quantity of foam issuing from the mouth.

Post mortem Appearances.—Fluidity of blood in the vessels; it is also dark in colour; purple or black patches (ecchymosis), with larger portions of extravasated blood, are seen between tissues and beneath membranes, and more or less serum is present. The lungs are congested, and heart full of partly coagulated blood. The brain is congested, arachnoid mem-

brane covered by spots of ecchymosis, and the ventricles contain an excess of fluid.

The fact that pigs affected with this or the preceding disease have been slaughtered and used as human food, has gone far to support the opinion that no anthrax poison is formed, or, in other words, that neither partake of the character of anthrax or carbuncular fever, although the general *post mortem* appearances so closely follow the type of those taken as an example. We must not, however, forget that the apparently healthy and clean parts of young cattle rapidly dying, or slaughtered early when suffering from black quarter, are not unfrequently made use of as human food. Malignant pustule is not inevitable after such a practice, nor yet putrid fever or death, to prove the unsoundness of such flesh; but the great supply of meat in our metropolitan and provincial markets is not without its effects upon a population using it who are, generally speaking, slow to observation upon such matters. If the previous history of much of the flesh food which finds its way to the poor man's table could be learned, we might have less difficulty in attaching importance to many signs now productive of no uneasiness.

Treatment.—Apoplexy among pigs is a most fatal complaint, and with its first appearance in one animal preventive measures should be instituted for the safety of the rest. They should be placed at once upon low diet, have regular exercise, the strictest cleanliness being observed, and a dose of medicine, such as the following, exhibited without delay:

RECIPE NO. 40.

Take of Epsom salts.....	2 to 4 oz.
Calomel.....	3 to 10 grs.
Ginger	2 or 3 drs.
Treacle and warm ale, sufficient.	

If constipation is great, clysters should be used in addition.

If there is time allowed by the mildness of the symptoms—which, however, rarely happens—the above dose should be

given to the affected animal. With the first death, a careful *post mortem* examination should be made by a veterinary surgeon, who will be best enabled to point out all proper details.—*Ed.*]

II.—ANTHRACOID DISEASES.

I. PARTURIENT APOPLEXY : *Parturition Fever, Vitulary Fever, &c.; Fievre vitulaire* of the French ; *Kalbefieber* of the Germans.

[This affection is frequently confounded in detail with two other diseases, viz., *Metro-peritonitis* and *Adynamia nervosa generalis* (which see pp. 422 and 459), all of which are viewed and described in other works as one disease, under the name of “milk fever” or “the drop,” &c.

The subjects of this malady are cows of all breeds that are heavy milkers and liable to plethora. It usually occurs at the third and later periods of parturition—*seldom before, and never follows difficult or protracted delivery, uterine hæmorrhage, flooding, abortion, or retention of the uterine membranes* (placenta).

Nature.—A blood disease, characterized by a rapid tendency to congestion of the brain, coma, and apoplexy ; occurring in connection with parturition, and possessing a great liability to recur with increased severity at each succeeding delivery. Few cases, however, recover even from the first attack.

Symptoms.—Premonitory signs, which are seldom observed, may be looked for immediately after calving. These are disinclination to move, staring appearance about the eyes, checked secretion of milk, accelerated pulse and respiration, with increased heat of mouth, extremities, and system generally.

The *second stage*, which usually comprises the first noticeable symptoms, is, in the majority of instances, entered upon during the first twenty-four hours after calving. The cow shakes her

head, totters and staggers in walking as if the hind legs or loins were weak, and shortly drops to the ground unable to rise. The eyes are bloodshot, fixed, and glassy, and almost insensible to the touch—she is nearly blind—the pupils are dilated, and the eyelids (*palpebræ*) twitch violently; the pulse is full but soft, with a frequency considerably below that found in the first stages. Animal heat is not above 102° or 103° F.

The *third stage* rapidly succeeds. The mucous membranes assume a dark purple hue, and the animal is totally blind. The head is probably turned backwards on the shoulder, or is



FIG. 40.

dashed from side to side, in great danger of breaking the horns or of hurting those in attendance. The pulse becomes slow, tardy, and infrequent, scarcely numbering more than twenty-five or thirty beats, and then gradually rapid, feeble, smaller, and at the end imperceptible. The breathing is slow and roaring (*stertorous*) and even difficult, and the pupils are now contracted. Animal heat rapidly declines, reaching as low as 95° F., and the horns, ears, and extremities are cold as clay. The udder is no longer soft and flaccid, but hard, turgid,

and unyielding. If fluids are poured down the mouth, they pass into the windpipe, as all power to guard the entrance to that tube is lost. Digestion is suspended, as indicated by swelling of the left side, from gaseous disengagement within the rumen or paunch, which greatly interferes with respiration, particularly if the cow is lying upon the left side. The discharge of fœces is not always arrested from the first, but constipation and stoppage of urine is now very evident. Convulsions recur from time to time, and death ensues frequently within forty-eight hours from the commencement of the attack.

Favourable signs consist of slight or returning consciousness, copious but normal discharge of fœces, increase in volume and strength of pulse, absence of decline in animal temperature,* return of milk, and desire to sit erect, partake of food, ruminate, &c.

Post mortem Appearances.—The whole body has the appearance of being well fed; blood-vessels charged with black fluid blood; ecchymosed spots are visible upon the heart, and often upon the lungs, stomach, and intestines, &c., &c. Sometimes the womb is also similarly affected, but not as a rule. Blood is extravasated over the brain, *medulla oblongata* and cervical portion of the spinal cord. In the substance of the brain, the characteristic *puncta vasculosa* of the *centrum ovale*—upon which pathologists place so much value as a sign—are present, besides excess of fluid in the lateral ventricles. In some instances the nervous system exhibits only these last-named lesions.

Treatment.—Preventive measures are attended with success if properly instituted; but a difficulty frequently exists with proprietors in their not being capable of forming suitable conclusions from an observation of signs equally with the medical

* Observations with the thermometer should be made hourly in these cases, as by it information can be gleaned prior to other symptoms appearing.

attendant of his stock. Cattle that are predisposed to parturient apoplexy, should receive, before calving, low diet of a laxative nature, with the occasional use of a few Epsom salts, and the udder drawn regularly as soon as the milk appears. Attention also should be paid in order to secure good housing, ventilation, and sanitary regulations.

Medical treatment consists of a copious bloodletting when the pulse is *full*. If insensibility, blindness, and decline of the pulse and temperature has taken place, bleeding will then hasten death. Next, and which would constitute the first step in treatment if bleeding cannot be accomplished, a powerful cathartic must be given. The following is suitable for large dairy cows, three-fourths may be given to an Ayrshire cow, or animals of the size :

RECIPE No. 41.

Take of Epsom salts	16 to 24 oz.
Calomel.....	1 „ 2 drs.
Croton oil.....	15 „ 30 drops.
Ginger powder.....	2 oz.
Treacle	1 to 2 lb.
Warm ale	2 qts.

Mix and administer with great caution, and during insensibility should be passed into the stomach by means of the tube of the stomach pump (Fig. 41). The catheter (Fig. 42) should be passed, and urine withdrawn. (See Fig. 128, page 368.) If any *tympanitis* (hove) results after the medicine has been given, the probang may be passed down the gullet to allow the gas to escape. Some practitioners administer the following :

RECIPE No. 42.

Take of aromatic spirits of ammonia	4 oz.
Ground gentian and ginger	2 „
Cold ale	1 qt.

Of the preparations of ammonia, the liquor, or watery solution, and sesqui-carbonate are also invaluable.

Enemas must be used every ten or fifteen minutes, and ice

or cold water should be constantly applied to the head. Dry friction to the body, extremities, and udder is of immense service. The milk should be drawn frequently, and warmth of surface promoted by rugs or a covering of straw when friction is not being employed. An erect posture should also be preserved as much as possible.

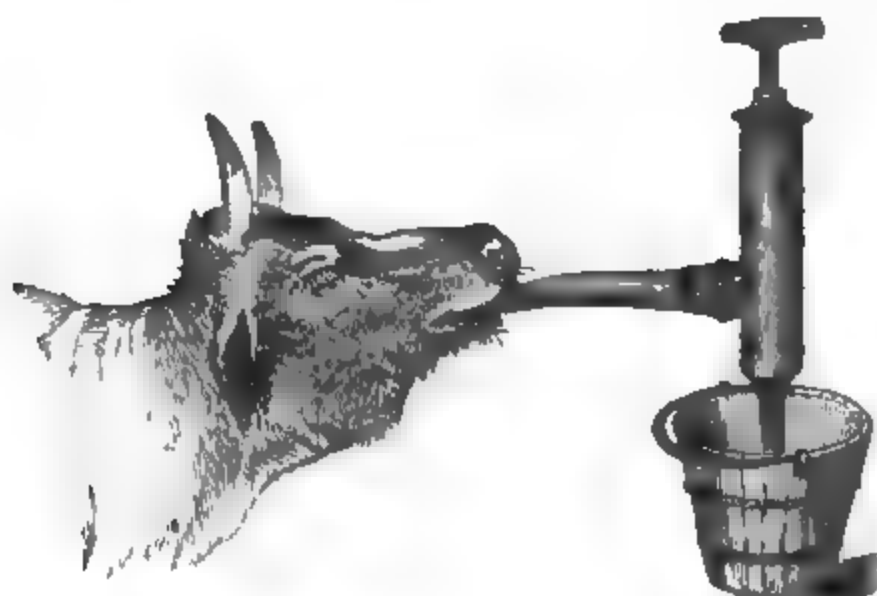


FIG. 41.

As soon as these details have been carried out, which will occupy some considerable time, the next step will be to organize



FIG. 42.

a system of nursing for the sick animal, and at the expiration of two hours, half the ammonia draught (Recipe No. 42) must be given and continued *every two hours*, until the medical attendant deems it necessary to make an alteration or change in the remedies, which he may require to do in accordance with symptoms. As a rule, however, the details already given will be sufficient.

If the signs of unconsciousness are persistent, further treatment becomes a complicated matter to the non-professional person. Solutions of strychnine or tincture of nux vomica are used endermically, *i.e.*, by injection beneath the skin. (See Fig. 30, page 90.) In this way sometimes the nervous system may be roused when absorption from the intestinal canal is entirely suspended. This failing, a second injection may be used; but it is not advisable to use large quantities, or at too frequent intervals. Galvanism may also prove serviceable, if the current is passed along the course of the phrenic nerve, in order to promote respiration. When success does not attend these measures, remedies are injected directly into the circulation. This is effected by opening the jugular vein, and after the insertion of a proper instrument or syringe, as seen in the engravings 18, 32, and 33, pp. 66 and 90, the medicine is passed downwards in the course of the circulation. These are, however, measures that can only be safely intrusted to the qualified practitioner and scientific pathologist; and although they at the present time constitute a kind of experimental treatment, there is encouragement to be gathered, and it is not unlikely that their effects may be considerably strengthened, and ultimately become powerful means of good.

Cows that have recovered from parturient apoplexy should not be allowed again to have calves: it is better to feed them for the butcher than run the risk of attacks that are certain to end in death at a future time. When it is desirable to retain and breed from a valuable animal, proper means for prevention should be instituted, which are usually of the character already given; but the advice of a veterinary surgeon in each case is necessary, as special conditions and peculiarities occur that cannot be discussed in general rules.—*Ed.*]

2. AFTER OR HEAVING-PAINS IN EWES: *Parturition Fever, Gangrenous Inflammation.*

[*Nature.*—Blood disease arising in consequence of an unnatural plethora existing at the time of parturition. Excess of artificial food, salt as a condiment, turnips, &c., and confinement in small spaces on rich pastures are fruitful causes.

Symptoms.—These occur about the second or third day after lambing, and consist of fulness of flank, staring look, constipation, deficient urine, having a high colour and strong ammoniacal odour; panting, straining, increasing irritative fever; swelling and redness of the external organs of generation, which are hot, and afterwards assume, successively, a deep red, purple, and, finally, black colour.



FIG. 43. —*Ewes with Heaving-pains.*

Straining becomes more intense as the disease advances, and continues until the animal sinks from exhaustion, and dies.

Post mortem Appearances.—Uterus, or womb, exhibits considerable ecchymosis, and is inflamed in places, and even gangrenous. The lungs are also frequently much congested, and their external surface, and that of the heart also, is ecchymosed. The right ventricle is full of dark and partly coagulated blood. In protracted cases the veins of the uterus contain pus, and death results from its absorption into the system (*pyæmia*).

Treatment.—The directions already given under "Braxy" are applicable here, and, when properly carried out, succeed admirably in preventing the malady. Medical treatment is not

of great use in *curing* the malady; but with the first death, as in all cases, a careful *post mortem* examination should be made by a competent veterinarian, and his advice sought touching the question of prevention.—*Ed.*]

3. RED WATER IN SHEEP AND LAMBS: *Sanguineous ascites*; in the vernacular, *Water-bellied*. *Pourriture aigue*, *Maladie rouge*, or *Maladie-de-sologne* of the French; *Diarrhæmia* of Delafond.

[*Nature*.—Blood disease, a result of an inordinate plethora, characterized by an extensive effusion of fluid within the abdomen, which results in sudden death. Animals suffering from this malady are said to be “wet” by the butcher.

Symptoms.—Few of the leading signs are noticed, as from their rapid development animals are attacked and found dead within a few hours. Where, however, opportunities have occurred favouring observation, they have been as follows: appetite and rumination suspended; the animal is dull, and moves with great disinclination, and frequently reels in suffering from being giddy (vertigo). The eyes are staring and pupils dilated; more or less blindness is present, and the head is frequently carried to one side. Constipation is severe, and other secretions are checked.

Post mortem Appearances.—Blood-vessels beneath the skin and over the body generally are congested; ecchymosis is present throughout; but the most remarkable sign is the presence of a great amount of red serum in the cavity of the abdomen. This affection is sometimes confounded with ordinary ascites (dropsy) of the abdomen, and the ascites of rot. The presence of ecchymosed spots, congestion, and colour of the effused serum are, however, infallible distinctive signs.

Treatment.—The general principles are to be adopted as recommended for “Braxy.”—*Ed.*]

4. BLOOD DISEASE OF LAMBS, commonly known as
Navel-ill.

[*Nature.*—A blood disease resembling braxy in older animals, characterised by a similar stagnation and rapid coagulation of the blood within the vessels, attended with local tumefactions beneath the skin.

Symptoms.—Great prostration, eyes dull and bloodshot,



FIG. 44.

mouth red and congested. The animal pants and lies persistently, having no inclination to move. The pulse is small or imperceptible, fœces and urine deficient, and swellings appear on various parts of the body, as the umbilicus or navel, the hind quarters, beneath the jaws, or upon the throat, &c., which are soft and fluctuating, containing a yellow gelatinous fluid. Death is rapid.

Post mortem Appearances.—The body exhibits every indication of being in a thriving condition, but the whole of the blood-vessels throughout are congested and the contents coagulated. General ecchymosis also occurs over the serous membranes of the closed cavities as the chest, abdomen, &c.

Treatment consists of general principles as already directed under "Braxy," and about to follow in a general summary.

Summary of Treatment of Enzootic Diseases.—The most successful results arise from a system of well-directed general principles of prevention. When *natural causes* occur, they are to be combated by improved stock management. If peculiar vegetation, by reason of its abundance and luxuriance, and influence of season and climate, are causes, animals should be removed from their effects as the periods come round ; when the pasturage of farms varies, *sudden removals* from poor to rich land must always be avoided.

Regular growth should be promoted in all kinds of stock, as well as health and vigour, by proper food and exercise. It is a mistake to suppose that the luxurious vegetation of summer's growth is to make up for a winter's starvation. When pastures are destitute of grass, hay, roots, and suitable quantities of artificial food, as oil-cake, are absolutely necessary to proper sustenance ; and when farmers suppose that winter's cold can be braved by their stock by mere exposure, they do not arrive at the conclusion by analogy, or calculate the losses that occur indirectly at a later period. Although *they* cannot effectually distinguish a sequence and concatenation of changes that intervene with the winter and summer, culminating in disaster, veterinary science can assure them that individual embarrassment and a widely extended paralysis result from such a want of consideration. But the practices and successes of agriculture itself afford incontrovertible information. The application of science to the farm admits of no doubt : of geology, as to the peculiarity of soils ; of meteorology, as to the nature of climate ; of chemistry, as to the nature and qualities of food ; of animal physiology, as to the peculiarity of the body, and results of the various influences : all these are testified by the scientific farmers of the Lothians and various special districts of England and Ireland. When such principles are acknowledged, although

theoretically the sciences may not be understood, we have a solution of the question "losses among stock" where farming is done by tradition and in accordance with the "tales of my grandfather."

Medicines and a low diet are of essential service in order to counteract excessive plethora, the certain forerunner of enzoötic diseases among cattle and sheep, &c. Excesses of nutritious vegetation, and close confinement in small pastures and folds, &c., during the consumption of such, must be avoided. In hilly districts the *desideratum* is shelter, but how that is to be provided becomes a question for the landlord and tenant. We simply point out the necessity, and there our duty ends.

When *artificial causes* prevail, an inquiry should be made into the nature of food and water, as well as general management. Frequently a change has been made in the food, and at the same time the animals may have been limited in their exercise. Those from a poor pasture or straw-yard have been suddenly transferred to a stall for feeding, and there supplied largely with rich food, rapidly assume that dangerous plethora by which disease is induced. Where splenic apoplexy appears, examine the water for the presence of organic material, such as nitrates, the result of decomposition of animal products. It may be necessary to suggest the removal, divergence, or closure of drains, and even forbid the use of the water. Plethora is to be counteracted by the use of the fixed and neutral alkalies, as nitre, sulphate of potash, Epsom salts, &c., and the supply of the nutritious principles of food should be regulated with due regard to economy, as well as the formation of fat and flesh, manure, &c., and always combined with materials that secure the necessary bulk and promote digestion and assimilation.

The flesh of animals that *die* from enzoötic diseases should generally be avoided as human food. Certain exceptions are made with reference to the clean parts of those *slaughtered* on account of black quarter, braxy, &c.; but even here there

is not always safety, as the healthy appearance of a carcase is not a proof of its soundness, and many animals are only slaughtered during the last few seconds that are left of life, when an undoubted blood poison has been established. By acute and constant examination we shall acquire more erudition, and eventually be able to ask for assistance in dealing legally and honestly in such matters. At present there is too much division to admit of proper action.—*Ed.*]

IV.—BLOOD DISEASES ARISING FROM ANIMAL POISONS OF UNKNOWN ORIGIN, NOT INDIGENOUS TO BRITISH SOIL, HIGHLY CONTAGIOUS, AND PRODUCING BY INOCULATION * THE SAME DISEASES IN OTHER ANIMALS OF THE SAME SPECIES, CONSTITUTING THE CLASS EPIZOÖTIC DISEASES, viz. :

**A.—RINDERPEST OR CATTLE PLAGUE.
EPIZOÖTIC PLEURO-PNEUMONIA.
EPIZOÖTIC APHTHA.**

B.—VARIOLOUS FEVERS, partaking of the foregoing characters, except in their being chiefly sporadic, but occasionally epizoötic, viz. :

**SMALL-POX IN SHEEP.
COW-POX.
CHICKEN-POX.**

EPIZOÖTIC OR CONTAGIOUS DISEASES OF CATTLE AND SHEEP.

[It is not generally known, but is a subject of congratulation to the British stock-owner, that our unparalleled herds of cattle are not subject to fatal contagious diseases indigenous to our soil ; or, more plainly, there are no instances on record, nor within the memory of the oldest and wisest farmer or other person interested in the welfare of cattle, that prove the existence of fatal contagious diseases among them arising spontaneously and in consequence of the nature of our soil, climate,

* See foot note, page 47.

mode of management, or any other cause. The only known indigenous contagious disease among bovine animals is the *variola vaccinae*, or cow-pox, common under certain conditions to the large dairy stock of Gloucestershire, Vale of Aylesbury, and other similar large districts. Several diseases that occur with certainty and regularity each year are pronounced contagious in character, but facts are not wanted to prove the incorrectness of the reasoning.

The maladies we, then, have to consider are those well-known contagious diseases recognized in the veterinary profession as foreign epizootics, viz.: *Rinderpest*, or the Cattle Plague; *Epizootic Pleuro-Pneumonia*, or the Lung Complaint; and *Epizootic Aphtha*, or Foot and Mouth Disease. Our notice will extend principally to their proved contagious nature, and the method which should be adopted in order to reduce their devastating properties, as well as prevent their future introduction.

With regard to the contagious nature of these maladies, notwithstanding the lamentable evidences which were witnessed recently in connection with cattle plague—earlier from pleuro-pneumonia, and more remotely and indirectly from aphtha—there are yet individuals to be found who not only deny it, but exert their influence politically, privately, publicly, directly, and indirectly, to prevent others believing such, and do all they can to impede action in the matter of eradication and suppression. Other persons also contribute to form a sect, who, admitting the contagious nature of the diseases in question, positively assert there is nothing foreign about them, and the farmers alone are responsible for their appearance in the filth and dirt which is allowed to accumulate on their premises.

We fully admit the title of every man to an opinion, and accord him honour in proportion to its weight and value; but we must urge no reasoning is so shallow as that which decides the non-contagious and foreign nature of the diseases already

named. In short, such opinions are not the result of close observation ; they are not the fruits of an intimate acquaintance with the action and progress of disease ; there has been no study in the question ; truly, they are mere assertions, having no support by facts or evidence of any kind, but usually party cries and political gags intended to attract attention in one quarter, while the siege is directed in another. Divest the subject of the fetters that hang around it at the present, let it become a *national* question, and the sophistry will be discovered and separated ; maintain it as a question of party, and the stock-owner and consumer of Britain may groan and continue to pay fabulous prices for a staple article of food which should reach us for a comparative trifle.

History.—The contagious diseases of cattle and sheep, as far as Britain is concerned, have been known but very recently ; but on the Continent of Europe, and in certain parts of Asia, they have prevailed for generations. Years before they visited our shores, those Eastern countries suffered from periodical invasions which swept away their cattle like chaff before the wind.

For fourteen hundred years the history of their ravages is before us, and scarcely a nation exists abroad that has not lamented the movement of armies through their territories, with plague-stricken animals as beasts of burden among them. From the days of Theodosius and Charlemagne to the present, vast havoc has been committed. They have by such means decimated Illyria, Northern Italy, France, and Belgium, and when banished therefrom, have spread by similar means to Hungary, where an equal devastation occurred ; and thus it went on from nation to nation, following, like grim death, in the wake of revolutionary armies for four hundred years, when we find our history at the period of 1223. Indefinite records fail to give particulars of more than one serious outbreak between that period and 1625. It then appeared in the north

of Italy, and extended along the banks of the Po, entered Padua and Venice. From 1709 to 1717 it again raged with violence. Tartary, Muscovy, Poland, Bessarabia, Croatia, Dalmatia, Upper Italy, France, Hungary, Germany, and Switzerland were invaded, and from thence it spread northwards to Silesia and the Baltic. In the kingdom of Naples 70,000 cattle perished ; many thousands also in Silesia. In Holland alone not less than 200,000 fell victims ; and in Europe it is estimated that 1,500,000 animals were sacrificed. In 1713 cattle plague was brought to England, but was arrested in the counties of Essex, Surrey, and Middlesex by the slaughter of 6,000 cattle.

From 1713 to 1730 it was characterized by periodical outbreaks here and there. By the wars of the period it was roused into activity, and again rapidly spread over the greater part of Europe ; Hungary, Bohemia, and Germany being almost laid waste. In 1745 Holland was again almost decimated, and from thence it came to England, and for twelve years continued to devastate our herds. In the third year 80,000 cattle were slaughtered, and double that number is said to have died of the disease. In the fourth year they were destroyed at the rate of 7,000 per month in order to arrest its progress. In Nottinghamshire and Leicestershire, during 1747, no less than 40,000 cattle died, and Cheshire lost 30,000 during six months of that year. For thirty years it continued to hang over Europe ; and it is computed that upwards of 30,000,000 of cattle perished. In 1770 Holland again lost a great number of cattle from the plague, no less than 375,441 being sacrificed. From thence it passed into Picardy, and destroyed 11,000, and returned again with renewed vigour to Holland in 1773, and devastated also Flanders, Picardy, and neighbouring countries.

It followed Napoleon and his army into Italy ; and in 1793-94-95 from three to four millions of cattle perished in Piedmont alone. It was carried to the Rhine provinces ; thence to

Switzerland in 1796, and found its way back, in the wake of the Imperial presence, to the very gates of Paris, not less than 12,000,000 *f.* representing the value of 130,000 animals which died in France only, while 11,047 were sacrificed in the Rhine Provinces. From 1792 to 1815 wars with Russia and other countries were constant, and the pestilence again appeared, Austria, Bohemia, Saxony, Prussia, Poland, Hungary, Silesia, and France being again the sufferers. In 1827 the Russo-Turkish wars were the cause of another outbreak of the disease in Bessarabia, Wallachia, Moldavia, Podolia, Volhynia, Prussia, Saxony, Hungary, and Austria. In 1830 it again appeared in Illyria, being conveyed from Austria.

In 1842 it was conveyed to Egypt and Nubia, 300,000 head of cattle dying therefrom. In 1843 it broke out again, when 35,000 died; and, upon a third invasion, 15,000 died—or, in all, 350,000 cattle were destroyed. In 1844 the countries bordering upon Russia were threatened, and in 1850 Austria was invaded for the ninth time within the present century. During 1852-53 it was principally confined to Russia, where great losses occurred. In 1854 it spread over a vast area of European territory, Austria, Poland, and Germany again suffering greatly. We next hear of it as affecting the cattle of our armies during the Crimean campaign, and also of its passing into Poland, Austria, and Prussia. Our next experience occurs at our own doors during 1865-66-67. But we need not write its further history: that is already compiled in form of an indelible character, and will only be read with interest by a succeeding generation. From England it was conveyed to Holland and France, and, notwithstanding that most stringent measures have been exercised, practices of a surreptitious character have been the means of prolonging its visitation, and disseminating the sad influences to various parts of the Continent.

These remarks apply not only to Cattle Plague, but have

also special reference to pleuro-pneumonia and aphtha. Each of these diseases, having one common home and origin, has generally prevailed simultaneously, and tended to render those with which they were associated still more deadly. As a rule, the animals have first suffered from foot and mouth disease (aphtha), and after the system has been reduced and rendered more prone to attacks from disease, they fell victims to pleuro-pneumonia, and even subsequently also to Cattle Plague. Thus in the camps three affections prevailed; and this occurred in Britain recently, a fact which, doubtless, acted as a great addition to the cause of mortality.

But the advent of peace, and cessation of war and tumult among nations given more to warfare and predatory pursuits than to agriculture and industry generally, did not bring about such a mitigation of contagious diseases as would be supposed from a consideration of the causes we have named as being all-powerful. Holland, Germany, parts of Austria and Prussia, Belgium, France, &c., represented the most industrial nations, and, after being swept of their supplies of animal food, turned their attention more vigorously to the creation of other sources of remuneration for their labour. Land was abundantly sown with corn, and this was used for the manufacture of starch and distillation of spirits; but they found that a great deal of refuse grain was the result of the processes, and therefore cattle were again in demand for its consumption. At this stage, a dependent trade sprang up—the dealing in cattle for supplying the distilleries, the few cattle left as a remnant of the previous havoc being speedily swallowed in the new request. The countries themselves were unable to supply the demand, and neighbouring States were invited to exchange their stock for the gold of the industrious. Gradually the cattle of the East were driven to the countries of the West, and as each State was drained, the dealers penetrated the Steppes and pestiferous districts of the East, and again brought out their character-

istic maladies, and the process continues to the present day. Our trade and connections with Holland, who supplies herself from many of these pest-ridden countries, therefore, renders the trade in animals a constant source of fear, and the introduction of Cattle Plague, pleuro-pneumonia, aphtha, and small-pox as likely to occur again as before. It is a mistake to suppose that all animals coming from Holland are Dutch cattle: they are collected from Austria, Silesia, Prussia, &c., which in turn collect them from the home of the plagues; and a process of smuggling also insures the entrance of fell disease in the face of Government enactments and stringent *cordons militaire*. Constant introduction of disease to a country keeps alive the activity of the virus. It is unaffected by heat, cold, or moisture, and at length the places become stations from which the scourges are never absent. Such is the condition to which Britain is now reduced with regard to pleuro-pneumonia and aphtha, and a little more would secure it in favour of Cattle Plague and small-pox. The blundering legislation of Government; their tendency to act on unreliable information; to admit a species of quackery instead of scientific advice; to place the administrative power and investigation of the maladies in foreign hands instead of the legitimate profession, stand as a perpetual monument to the disgrace of a British Parliament. A mere hand-full of men fully qualified to suppress the plagues and satisfy an injured public, were scorned and rebuked. History and experience went for nothing. The sayings and doings of a "Circumlocution Office" were the order of the day; and the public groaned, suffered, and were compelled to pay for the troubles imposed upon them.—*Ed.*]

I. THE STEPPE DISEASE : *Russian Cattle Plague, Contagious Typhoid Fever of Cattle, Typhus Contagiosus Boum, Pestilential Fever.*

[If it were required to furnish an example of a most rapidly fatal disease of horned cattle, the Steppe disease might be adduced without hesitation ; nay, further, it may be estimated the most fatal which has been observed, and in consequence has been named "*Rinderpest*" by the Germans. It is a highly contagious fever, attended with inflammation and specific lesions in the alimentary canal, which correspond remarkably with those of typhoid or enteric fever of man. In consequence of an impacted condition being observed in the third stomach of animals that succumb to this affection, the term *löserdürre* has been applied by older writers, and even respected by celebrities of our day. But this condition is not peculiar to cattle plague : as in the majority of instances where disease of a non-contagious character terminates fatally, distension of the omasum, by collections of dry solid food, are not at all uncommon.

Symptoms.—A period of incubation, during which no appreciable signs of disease are manifest, always precedes this in common with all epizootic affections. This may vary from four to fourteen days, but it has been known to terminate as early as twenty-four hours.

We understand by the period of incubation that time which elapses between actual contact of healthy animals with others that are diseased, and the first manifestation of the characteristic signs. It is that period in which the virus of the affection, introduced within the system, multiplies and acquires that power and malignity only to be observed in contagious maladies. It is a period, too, during which an inconceivable mischief is executed without any indication, and baffles all skill to recognize.

It is a period also in which the fate of animals in close proximity is almost certain to be doomed, and among which it spreads with alarming rapidity.

Dulness and prostration of strength, a husky cough, and slightly staring coat are among the earliest symptoms; and usually a shivering-fit may be observed at the outset. In many cases the *first stage* is altogether indefinite, and with the shivering-fit commences the *second stage*. Under ordinary circumstances, but a brief period exists between them and the development of high fever and catarrhal symptoms. The

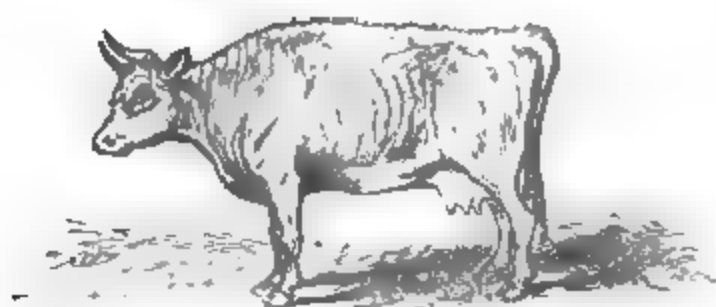


FIG. 45. *Rinderpest.*

mucous membranes are the seat of the affection, from which purulent discharges flow most copiously. The appetite and rumination, with the secretion of milk, are suspended or totally arrested. The teeth are ground incessantly, and an eruption forms upon the tongue, lips, and membrane of the mouth, and a copious salivation follows. The pulse is frequent and full, breathing laboured, bowels constipated, urine scanty, painful cough and intense thirst, back arched (Fig. 45), loins tender, stiff movements, dry harsh skin. The temperature of the body is very variable. In the *third and last stages* the eruptions are observed to have spread over the nose (Fig. 46), and extend to the clefts between the feet; but more usually they have burst and left behind a number of unhealthy-looking erosions or ulcers, the membranes assuming a purple appearance. Abdominal pains succeed each other rapidly, and are tolerably

persistent ; nervous twitchings over the body are observed, and a violent and offensive diarrhoea succeeds an apparently obstinate constipation ; the skin is detached in places from the subjacent tissues, and the spaces being occupied by air (*emphysema*), as a result of decomposition, form large tumours over



FIG. 46.—*Rinderpest.*

the body, especially the back and loins, and give rise to a crackling sound when the hand is passed over them. The vital powers are now prostrate ; general emaciation progresses quickly ; the pulse becomes very frequent, small, feeble, or indistinct, and dissolution is rapidly approaching. _Indeed, such is the progress of the affection that, in animals which die under its influence, putrefaction may be said to precede the departure of life.

Post mortem Appearances.—These are characteristic. The general evidence of emaciation is complete in all parts. Foetid accumulations of gas are liberated when the abdomen is opened or intestines punctured, and the same occurs from between muscles, beneath the skin and the closed cavities. Large spots of extravasated blood (ecchymosis) occur over various parts of

the intestines, urinary and generative organs. The third stomach is usually impacted in consequence of the arrest placed upon digestion, and is frequently very much distended. In some cases the leaves of this organ are attacked by ulceration and even perforation; but these lesions are not special or confined to cattle plague.

The fourth stomach and small intestines are the seat of active inflammation, and beneath the lining mucous membrane profuse exudations of plastic lymph occur, which eventually determine a corresponding number of points around which ulceration commences. Beneath the lining membrane of the respiratory and circulatory organs (*pleura*), pericardium, and endocardium, patches of ecchymosis appear—undoubted evidences of a state of blood poisoning.

Treatment.—The most disappointing results occur from the treatment of this affection. All kinds of remedies in every variety of form have been tried, and in all instances the same ends were reached. Deaths occurred at the rate of 60, and even as high as 95 per cent., and animals that recovered formed the majority of those that received no medical aid whatever. Such is the nature of the disease, that we may state rapid destruction of tissues essential to life has proceeded beyond the possibility of being arrested by other remedies than the efforts of Nature herself, long before even observable signs are developed. The whole pharmacopœia of remedies has been ransacked, and likely, as well as most unlikely, prescriptions found favour during the serious excitement that ensued. The quack, farrier, and cow-leech drove a “roaring” trade in the sale of their trashy medicines, and even added to their unblushing effrontery the testimony that their potions had cured hundreds. Officious inspectors, armed by a magistrate’s warrant, galloped furiously on horseback from place to place, carrying a gun over the shoulder and powder in the flask, ready to practise with an instrument probably never before used by them,

and certainly much out of place as forming one of their *chirurgicum armamentarium*!

Among the popular remedies was a mixture of assafoetida, garlic, &c., the odour of which was by no means inviting. It was based upon the recommendation of a Mr. Worms, who asserted he had cured animals affected with plague in the island of Ceylon. Such success, however, did not crown his asseverations and efforts in this country, as the animals died as fast as ever in spite of the remedy and Mr. Worms himself. Next in order came the vaccination remedy, out of which medical men were not above trying to turn an honest half-crown per head, and for this many forsook the higher animal, man, and became general vaccinators of bovine animals for the districts. Homœopathy also raised its voice, but succeeded no better; and all remedies, the gun included, assisted in the general spoliation of 1865-66, by which upwards of two and a half millions of money were riddled from the pockets of the agriculturists!

Ample opportunities for studying the nature of the disease and effects of remedies were given by the Royal Commissioners, many of which came beneath the personal observation of the Editor; and it is but a duty to acknowledge that the results were but the same which have been observed on the Continent years ago. His personal experience extends to the outbreak, as it occurred in and around the metropolis, as well as in many of the southern and midland counties of England. Throughout, and in every case, the disease gave unmistakable evidences of its only mode of propagation—that of contagion. It occurred in more instances than one, that the origin remained unexplained for some time; but the evidences we possess of the subtlety of the poison leaves no doubt as to the ready communicability, by the virus being conveyed in the clothes of persons; hay, straw, manure, offal; animals, such as dogs, and even game; rats and mice in drains, probably also flies in

hot seasons, and even atmospheric air. Such disorders, then, call for measures in advance of their observed effects; and the preservation of our home stock will depend upon the display of sound judgment, which can be gained only by a scientific estimate of their origin, effects, and mode of propagation. To attempt a cure of them is to put, as it were, a firebrand through their midst, and fan the flames of contagion, which only die out after the animals themselves are no longer living to be subject to their influences.--*Ed.*]

2. EPIZOÖTIC PLEURO-PNEUMONIA.

[*Synonyms.*—Various terms are applied to this malady. In Britain it is known in different localities as the Lung Plague, Lung Complaint, Lung Disease, New Disease (in contradistinction to Aphtha or Foot and Mouth Disease), Epidemic or Demic, &c. Dr. E. Headlam Greenhow, in his “Report on Murrain in Horned Cattle” to Government in 1857, gave to it the name of “Pulmonary Murrain.” Among the Germans it is known as “*Lungenseuche*,” *Peri-pneumonia*, and *Exudativa contagiosa*. Delafond, a celebrated French writer, terms it *Maladie de poitrine du gros Bétail*, and adds “*Connue sous le nom Péri-pneumonie contagieuse*.” The Italians term it *Polmonea dei Bovini*.

Nature.—Like “Rinderpest,” it is a highly contagious disease peculiar to the ox tribe, exhibiting no preference for the breed or age of cattle, nature of soil, climate, season, &c. By some writers it has been estimated a malignant fever, having local manifestations, which are extensive exudations of an inflammatory character, confined to the lungs and cavities adjoining those organs.

Epizootic pleuro-pneumonia occurs in two forms: apparent, in which serious evidences of constitutional disturbance take place; and the latent, in which great difficulty occurs in diag-

nosis during early stages of the complaint, especially when lesions are found to have advanced considerably, rendering life a paradox.

Period of Incubation.—As in other contagious affections, we have in this an incubative stage, which may vary from two to six weeks ; but, as a rule, about forty days are admitted to be the period that elapses before the local signs are manifest, and which has been found reliable data in practice. Cattle returning from fairs, or from localities where the disease prevails, have been known to show symptoms about the time named ; and it has become a settled fact that during the first six weeks of the life of a cow within an infected town dairy, is the time in which the functions of health only are executed. Attempts have been made to prove that six months might elapse before the disease is developed. Such, however, we think, is impossible : the reasonable inference is that when animals are affected, and the known contact with diseased animals is so far removed, there must have been some other source of contagion.

The introduction of pleuro-pneumonia to Australia furnishes an apparent exception to the rule, similar to that just spoken of. Animals were taken from England—bulls for breeding purposes ; three months were occupied on the voyage, and the disease broke out on their landing, and has never been eradicated since. It is doubtful if the bulls were infected prior to their being taken on board at a British port ; but, what is probable, hay, straw, &c., may have been supplied to the ship from infected places, and thus contagion has been conveyed on shore in Australia by being communicated to the animal during the voyage. Four years ago the malady raged greatly in Tasmania, and the Editor was applied to by the authorities for information regarding its appearance in Britain, results of treatment, &c.*

From the statements furnished, it appears that the country

* The Report appeared in "The Hobart Town Advertiser," 24th July, 1865.

has now become a station for the disease, and stringent measures only will succeed in banishing it.

How to Detect the Disease.—In order to detect the affection, a considerable acquaintance with the habits of healthy animals is requisite, together with close and frequent observation; and, added to this, no investigation can be complete without exercising a knowledge of auscultation, *i.e.*, a study and comparison of the various sounds that are manifest during respiration in health and disease. This is ordinarily effected by applying the ear to the sides of the chest, and is greatly assisted by adopting percussion, or the means of eliciting sounds by tapping the sides with the knuckles or a special instrument termed a “pleximeter.” In addition, the thermometer is of essential service, but its use at present has only been of a limited character. In all cases where the Editor has employed it, the disease has not only been detected during its existence, but an elevation of temperature is found to precede the attack some days. Such an indication is of immense value in *all* the contagious diseases of cattle, as it enables the observer to single out those undergoing an incubative stage, and thus limit the spread of contagion. The thermometer bids fair to become an indispensable instrument in the detection of these diseases, and no examination of suspected animals can be perfect without it.

Symptoms.—During the period of incubation the animal is denominated “infected,” and throughout may be observed a general improvement of condition and increase in the yield of milk, all of which are doubtless referable to the influence of the poison upon the blood and nervous centres.

The progress of the disease may be divided into three periods or stages.

First stage.—In this signs are usually obscure and invisible to the non-professional or unpractised person. They are mostly confined to an elevation of animal heat, as indicated

by the thermometer, probably amounting to 103° or 104° F. There are also signs of disturbed respiration, and slight but unusual sounds in the bronchial tubes. The pulse is also raised in frequency, and the attendant may have observed a shivering-fit. More rarely a cough or "husk" is noticed, with loss of appetite, hot mouth, dry muzzle, and suppressed secretion of milk. When these are observed at the outset of the disease it is likely to be rapid. In ordinary cases they mark the commencement of the following period.

Second stage.—This may not be entered upon for several days after the signs just enumerated have existed. The signs are unmistakably those of a febrile character. The milk is decreased, mouth hot, breath rather tainted, mucous membranes injected, bowels constipated, cough more frequent, hard, and persistent, as well as troublesome; the coat stares, skin yellow and scurvy, and fits of shivers intervene; the pulse becomes rapid and full, with a moderate degree of firmness, numbering eighty to a hundred beats. The activity, however, is but of slight duration, for it shortly becomes smaller, feeble, and not so distinct; a rapid and difficult breathing is observed, and the animal endeavours to facilitate the process by extending the nose and bringing the neck into a straight line, while pain is evinced in a low moan or grunt that accompanies each expiration. When these signs are developed early there are fears of a rapid and fatal termination.

Further progress of the malady is marked by dilated nostrils, the sides of which are moved extensively by the passage of air. A limpid discharge may be seen to flow from the eyes and nose, and not unusually it becomes of a purulent character. The extremities, as well as the horns and ears, are cold, urine scanty and high in colour, bowels still costive, mouth clammy, the skin is harsh and dry beneath the fingers, and appears tightly bound to the tissues beneath; the body wastes, and weakness proceeds apace. Pressure between the ribs imme-

diately behind the elbow, or upon the spine over the back and loins, gives rise to pain, and a low moan is uttered.

A loud rushing sound of air is heard through the windpipe, bronchial tubes, and over their inflamed surfaces, if the ear is placed at the bottom of the neck; but still louder sounds are

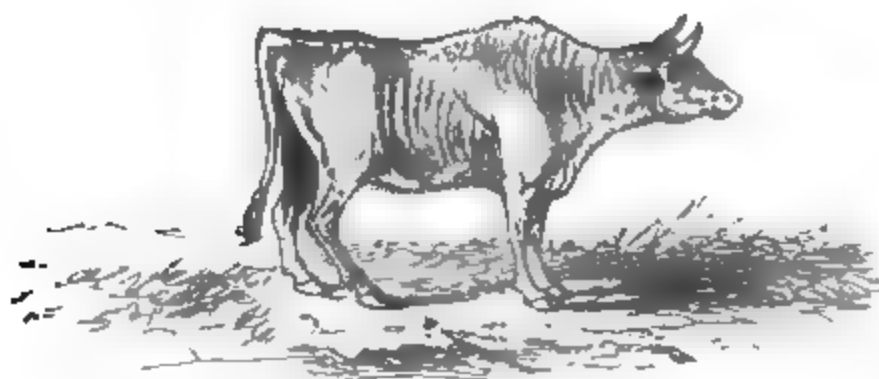


FIG. 47.—*Epizootic Pleuro-Pneumonia.*

to be heard at the base of the lungs by listening at the top and sides of the chest, a little behind the shoulder-blade. Behind and below these parts no sound, or perhaps only a kind of wheezing tone, can be detected, when we may expect that consolidation of the lung has taken place, and even effusion. Other sounds, however, not of a respiratory character, are detected, and distinctions are necessary to a correct diagnosis. The most common is that known as the "friction sound." As the lungs move in the respiratory process, their surfaces are constantly in close approximation with the inner sides of the chest, and when undergoing inflammatory action become thick and rough from deposit, and during motion the sound referred to is developed.

The disease is confined to one lung only in some cases, and when this happens the respiratory murmur in the sound side is much louder, in consequence of the additional offices demanded from it. When both are affected, we must then anticipate peculiar effects—changes of structure as well as complications.

One portion may become gangrenous and detached in the process of mortification. In some instances cavities form in their substance as the result of abscess, when sounds are modified and special ones introduced. These sounds, technically denominated *râles*, are various, and depend for their production upon the size of the cavity, its outlet, and nature of the contents.

There are favourable cases in which the functions of the lungs are gradually resumed. This takes place in consequence of the absorption of the products of inflammation, which removes the obstruction that is placed upon the action of the air-cells and organs as a whole. Such a termination is termed "resolution." Gradual recovery takes place; the pulse assumes strength and volume, and loses its frequency; respiration becomes slower, more regular, and the murmur of health is progressively established. The appetite and rumination, together with the lacteal secretion, which have not been entirely suspended, are improved; the eyes become clear, and discharges from the mucous membranes decrease. A dewy moisture is found upon the muzzle, the mouth is also cool and moist, and signs are those of returning health. Such an animal may give birth to a calf, and afterwards make tolerable flesh and fat. In fact, the owner should make it his study to feed her up as soon as possible for the butcher, after the signs of recovery manifest themselves.

In others an opposite state of affairs is developed. Contemporaneous with the amount of inflammation, there occurs a corresponding collection of water within the chest (*hydrothorax*). The pulse then is weak, sometimes intermittent or irregular, and the obstruction to the circulation is evident in the production of the venous pulse. A pallor of all the mucous membranes now is visible, and *œdema* or dropsy of the skin beneath the chest and abdomen, as well as the extremities, takes place. The breathing is difficult; the animal gapes and grunts, and the nostrils flap more and more; at length weakness gradually increases, and the animal drops and dies almost directly from

a process of internal drowning. One of the immediate causes of death that is most common is sudden distention of the rumen from gaseous emanation as a result of the arrest of digestion. The cause of death is therefore much aggravated by the addition of pressure from behind, and thus the asphyxia (suffocation) is complete and rapid when the chest contains water. Such terminations are frequently independent of each other.

The last form of epizoötic pleuro-pneumonia exhibits a tendency towards prolonged duration. For a long time no progress is apparently made either towards recovery or death. The eyes discharge an offensive muco-purulent secretion ; the appetite is capricious, and emaciation progresses so rapidly that the owner observes his animal get poorer every day. A cough, which is very troublesome, prevails continuously ; it is accompanied by gurgling sounds—mucous *ralès*—in the windpipe, and among the putrid and highly offensive pus that is regularly expectorated, portions of the lung that are undergoing gradual disorganization are expelled. The membranes are pallid, eyes sunken, animal temperature exceedingly low, and the loss of strength is great. The animal is now in a state known as hectic, from actual consumption, and an offensive diarrhœa ensues ; which typhoid symptoms are but the precursors of a rapid death.

Post mortem Appearances.—When the chest or thorax is exposed, after the manner of the knacker, viz., by breaking the ribs at their union with the spine above, and sternum or breast-bone below, one of the most attractive signs of the presence of epizoötic pleuro-pneumonia is the extensive flow of fluid from the cavity, amounting, in many instances, to several gallons. There are also, floating in it, large flakes of a yellow fragile trembling mass, known as plastic or coagulable lymph, the result of the active inflammation that has been going on.

If the divided portions of the sides of the chest are now

raised, some opposition is felt. This arises from the union by the plastic lymph on the surface of the lungs to the inner sides of the ribs, constituting the so-called "false membranes," or "adventitious tissue" of inflammation. Sometimes also the lungs are united by the same means to the pericardium (heart-bag) and the diaphragm (midriff); and by these means their action is very much diminished during life.

When the lungs are detached from their several connections, natural as well as adventitious, they are observed to have become enormously heavy. The lungs of healthy animals are not so: those of an Ayrshire cow do not weigh more than 5 lb., and the same organs in a large "short-horn" not more than 8 lb.; but one only of these, after disease, in a moderate-sized animal weighs as much as 30 lb., and in large animals the whole organs have varied from 75 lb. to 1 cwt. The lungs of healthy animals float in water, and have a clear bright salmon colour; but those that have suffered from the process of inflammation, as noticed in the disease in question, partake of a dirty or grey colour, with more or less tint of bluish red or purple, and their surfaces are rough and thickened, and substance hard, instead of being smooth, elastic, and yielding.

The cause of these changes is the inflammation alluded to, which, in the nature of the lungs of cattle, finds suitable tissue for the accommodation of exuded matter from the blood-vessels, the presence of which destroys the properties of expansion and contraction, and brings about the inevitable result, suffocation.

The nature and structure of the lungs are not generally understood. An outline is of great value in explaining the results of disease, and the writer here reproduces an illustration which he has found successful in conveying to the students of his class an idea of those organs, and their capacity for structural change. The picture, however, is far from being complete, as, in addition to the mechanical as well as physical characters

introduced, the reader must acknowledge the existence of that complex principle we denominate "vitality"—a condition more readily accepted than understood in description.

Let us imagine a number of caoutchouc balls or bladders are attached to the ends of small hollow tubes, each having a connection with another tube, and as they coalesce or unite, become larger, until they terminate by repeated union in one large hollow branch or tube. Such an illustration is also assisted by the appearance of a bunch of grapes hanging from one stalk; but we must suppose them all to be hollow and elastic, capable of expansion from pressure exerted on the inside, and contractile, capable of reducing their size after each expansion to their original dimensions.

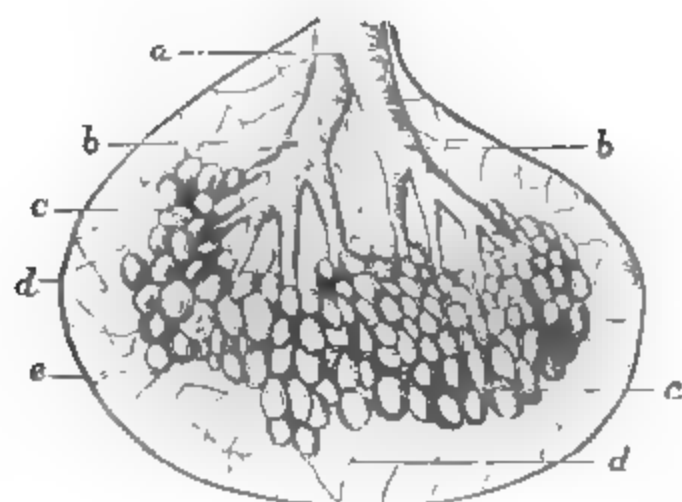


FIG. 48.—Diagram showing the arrangement of the Lungs internally.

- | | |
|-------------------------|---------------------------------------|
| a. Windpipe or Trachea. | d. Interlobular substance. |
| b. Bronchial tubes. | e. Investing Membrane, called Pleura. |
| c. Air-cells. | |

In this illustration or imaginary picture the large and single branch represents the *trachea* or *windpipe*; the smaller ones are the *lesser windpipes*, called *bronchial tubes*; and the hollow grapes or caoutchouc balls or bladders are the *air-cells*, filled at every inspiration. We are next to suppose that the twigs and balls are enclosed within a large elastic bag—thin and transparent—containing a quantity of thin fibrous but elastic

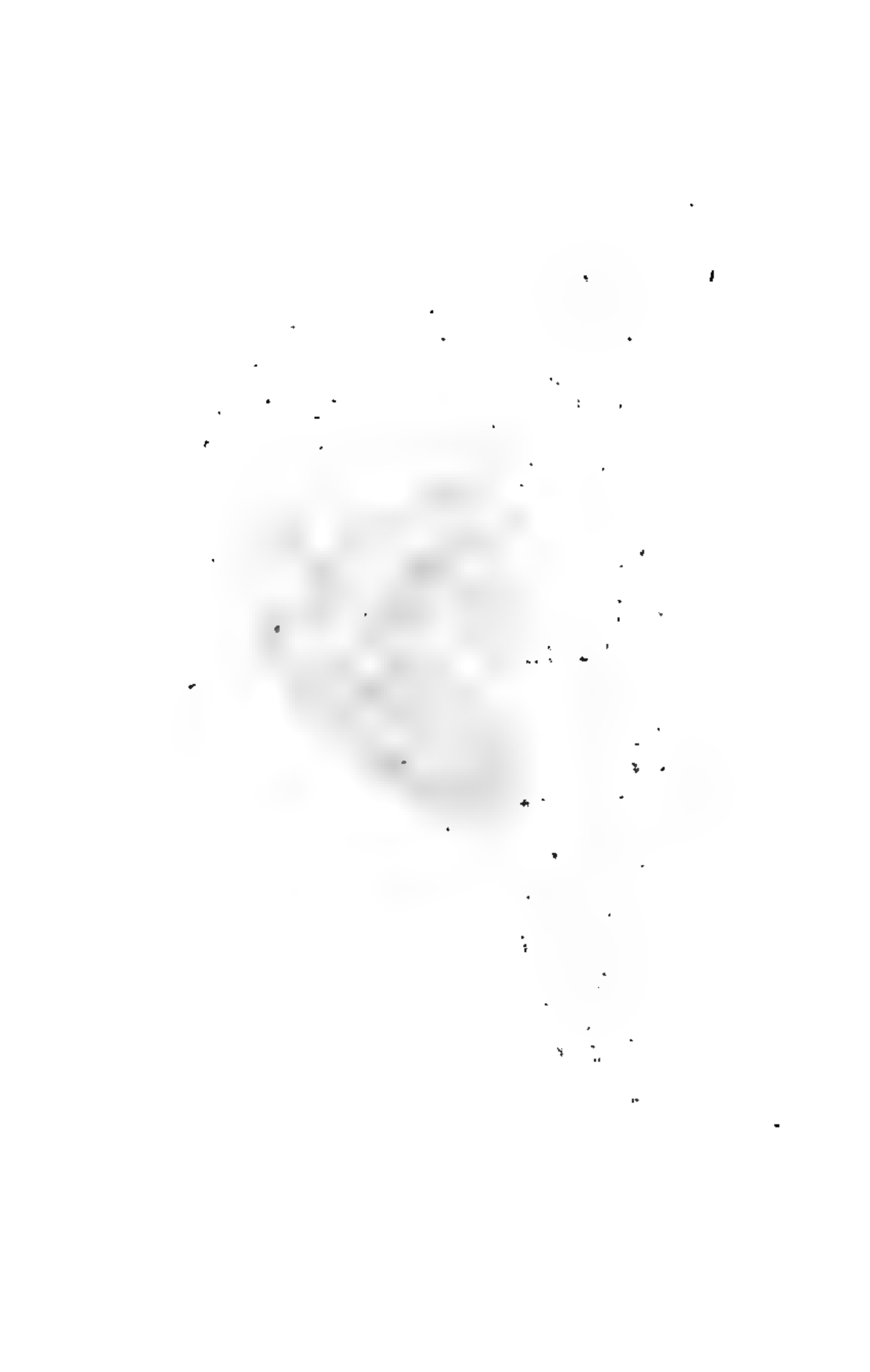
material—say cotton wool or fine shavings of India-rubber. The latter are so arranged that they separate each twig and air-cell from its neighbour, and beautifully accommodate the latter in their motions of *contraction* and *expansion*. The large outside bag becomes our investing membrane—the *pulmonary pleura*; the intervening substance—cotton wool or India-rubber shavings—the *interlobular tissue*, through which are caused to spread or ramify in every conceivable direction a number of arteries, veins, and nerves, all derived from their respective parent sources, the heart and nervous system. So far our picture has been described in a state of health. We must now endeavour to convey an idea of the same under disease—epizoötic pleuro-pneumonia.

The blood-vessels are charged with an unusual amount of blood, and the process is known as inflammation. The walls are subject to an internal pressure, and the size, outwardly as well as inwardly, is greatly increased. They are elastic, and suffer a *stretching*, in which the tissues of which they are composed are separated from each other; they become thin, and allow the contents of the blood-vessels to pass out among the *interlobular tissue*—the cotton wool or India-rubber shavings. It will be thus seen that when the interlobular tissue becomes charged with such matters, the results must be twofold: first, pressure upon the air-cells and diminution of their size, and secondly, a destruction of elasticity as well as contractility. But a still worse result is inevitable. Formerly, atmospheric air taken during respiration passed through the thin delicate walls of the air-cells, and became dissolved in the blood of the equally delicate blood-vessels for the purpose of purification; but now all these actions so essential to life are no longer available, and the animal dies from suffocation.

To examine the internal arrangement and nature of the structure of diseased lungs, the organs are divided in places by a knife. They then present a marbled appearance, such as



FIGURE III. *The Lungs and Calligonum*



is seen in Plate II. The dark red or purple masses are composed of blood-discs, fibrine, &c., while the lighter portions or separations are fibrine. The serum or watery portions of the blood are also present, but the major portion we have already noticed as rushing from the chest as soon as the ribs are fractured. The appearances that are thus given to the interior of the lungs bear great resemblance to the venous arrangement of marble structures in outline, and is therefore characteristic of epizoötic pleuro-pneumonia.

In the interior of the windpipe and bronchial tubes are large quantities of plastic lymph, which sometimes block up the passages and present a solid counterpart of the whole ramification. Such a disposition of false membrane is not uncommon, as the writer has seen such cases associated with the sporadic as well as epizoötic form of pleuro-pneumonia.

Abscesses are found within the substance of the lungs in some of the more advanced cases, and by communication with the bronchial tubes give exit to a great amount of foetid pus; at other times, which are, however, rare, the discharge takes place within the chest (pleural cavity), when the *amphoric râlè* is established. Collections of pus (*empyema*) within the cavity of the chest are not common among cattle, death frequently taking place before suppuration is sufficiently established, or, if it has commenced, before a large quantity can be discharged.

In animals that die from pleuro-pneumonia all adhering false membranes in the chest are carefully pared and scraped off by the butcher, in order to give the carcase a more presentable appearance. The deception, however, is not complete, except with those who are unacquainted with the disease and the fraud. For their benefit we draw attention to the fact that in health the lining membrane of the chest (pleura) is smooth, glistening, and transparent; but in disease, and after the surfaces have suffered deposit from inflammation, they are opaque and rough, and when dressed by the knife are dull and dry in addition.

Medical Treatment.—What has been already said regarding the treatment of cattle plague by medicines applies also to pleuro-pneumonia. As curative agents they appear to have done no good whatever. The veterinary surgeon has, however, succeeded in finding that by a judicious use of mineral tonics, as the sulphates of iron or copper, much good may be done in the way of fortifying the system against contagion. Such remedies, however, call for great supervision and care. They are calculated to do an immense amount of good, but should not be prescribed, except under the directions of a veterinary surgeon, as the drying of milk in dairy stock and interference with general functions is apt to supervene. The treatment by prevention will be further discussed at the close of the description of epizootic diseases.

Inoculation has been practised with questionable success. The method usually pursued is to take the serous fluid obtained from the lungs of an animal as soon as slaughtered, and place it beneath the skin of the tail by means of a syringe (Fig. 30), described at page 90. The point of the hollow needle is caused to penetrate the skin, and the barrel of the instrument is emptied by pressing down the piston in the usual way. For this purpose, however, but a few drops are required. The dairymen of London are in the habit of tying a piece of the diseased lung upon the tail after an incision through the skin has been made. The result of such a proceeding is that the animal loses the tail in many instances by gangrene, large swellings appear on the haunches and contiguous parts, and in others the animals die; but as a means of reducing the effects of pleuro-pneumonia there is not sufficient evidence to show.*

* Experiments professing to be for the object of testing the efficacy of direct inoculation for pleuro-pneumonia have been recommended and practised with very great looseness. The peculiar subtle characters of a contagious disease are not sufficiently weighed with care. It is a very general practice to recommend and adopt the remedy after an animal has succumbed to the affection. The premises are in

On the other hand, there is much to avoid, as in other contagious affections; but on this head further remarks are reserved until speaking of general preventive measures.



FIG. 49.—*The Foreign Cow, generally supposed to be Dutch, a prolific source of Contagious Diseases.*

Until the year 1842, Britain was free from the scourge of epizootic pleuro-pneumonia. At that time it was raging with violence in Friesland; and as our trade with Holland was rapidly increasing, British ports were at once thrown open to

all forms and purposes infected by such disease, and doubtless many other animals are also undergoing the incubative stage, having become infected from the one already dead. We contend, therefore, that inoculation in such cases is no test of efficacy, as, with the existence of pleuro-pneumonia upon the farm, no one can arrive at a safe conclusion whether the conveyance of the malady has really resulted from a direct cause or from the artificial means employed. All the profitable terminations of pleuro-pneumonia have been witnessed equally with its unmolested march through a herd equally with inoculation; hence our disbelief in the sufficiency of the evidence at present before us.

foreign stock (Fig. 49), and at the same time to pleuro-pneumonia, which has never been eradicated. The towns where large dairies exist and markets held, and the farms of cattle dealers are not only stations of the disease, but in most instances sources from which the malady is being continually propagated. These facts apply to Ireland in a most remarkable degree. It was particularly noticed as an incontrovertible fact that, during the restrictions placed upon the movement of cattle, &c., in 1865-66, pleuro-pneumonia decreased rapidly. Many affected animals doubtless were slaughtered or died in consequence of their connection with the plague, and this, with the careful purchases afterwards made, was successful in clearing many dairies of the malady. The disease, however, did not die out, nor was it effectually eradicated. Had the measures continued this might have been effected; but little, however, remained, and the country might be said to have been then comparatively clear of pleuro-pneumonia. At length the restrictions were removed, and the importation of cattle from Ireland recommenced in almost countless numbers, and with the proceeding epizootic pleuro-pneumonia again re-appeared, and has continued to track the footsteps of every (Fig. 50) Irish drove of cattle to the present time.* *Pleuro-pneumonia epizootica* possesses one point of difference from Cattle Plague and other contagious diseases that is remarkable. It is insidious in its attack, and steals among a number of cattle, escaping observation, and for a time defying all attempts at detection. The period of incubation being of greater duration, is also

* The writer has no difficulty in testifying upon this point. In addition to his acquaintance with the results of the re-introduction of Irish store cattle to England and Scotland, as gathered from personal observation, he has put himself in communication with many intelligent veterinarians throughout both kingdoms, and the result in every case is the one statement that epizootic pleuro-pneumonia is traced to the introduction of Irish cattle.—*See Editor's Prize Essay on Pleuro-Pneumonia, "Highland Society's Transactions," 1870.*

favourable in an eminent degree to its murderous and deadly attack. Animals live on, but as they do so, and probably also while they exhibit unmistakable signs of health, may give out the seeds of poison to all around. It is thus that, with the



FIG. 50.—*Friends from Ireland, with a fresh stock of Pleuro-Pneumonia Epizootica.*

short lives of animals, and the constant purchases made in our markets, contagion is kept rife, the mature virus of the affection being regularly introduced from abroad, particularly by the cattle from Dutch ports. While the Continent is charged with it, and our ports are open, it is an utter impossibility to avoid the consequences. A rapid traffic in cattle, which our country demands, also proves an obstacle to its extinction; and summary measures, which might in other diseases be available, prove no barrier to its wholesale distribution.—*Ed.*]

3.—EPIZOÖTIC APHTHA: *Vesicular Epizoötic; Vesicular Aphtha, &c., &c.*

[*Synonyms.*—Various appellations are given to this affection in various parts of the United Kingdom. In Scotland it is known by the name “Murrain;” in England, when it first appeared, the term “Epidemic” was applied to it. Generally it is known as the “Foot and Mouth Disease,” “blisters,” “demic,” and “tic” (as a contraction of epizoötic). It is the “*Eczema epizoötica*” of Professor Simonds.

Nature.—With reference to the latter term, there appears to be some reason to question its accuracy as indicating the nature of this disease. This is based on the following facts. Pure eczema is a vesicular disease common to all our domestic animals; non-contagious, recurrent, dependent upon a given mode of diet, and sporadic in character. Vesicular aphtha, on the contrary, is highly contagious, occurring but once as a rule in the lifetime of the animal, belonging to a class of eruptive fevers dependent upon the introduction of an animal poison to the system, and communicable from animals of one kind or species to those belonging to another. Lastly, it is of foreign origin, and is a blood disease; while eczema is only a vesicular eruption of the skin, totally bereft of all connection with the specific conditions of the blood.

In the home of its birth, vesicular murrain appears as an aphthous eruption in the mouth and upon the feet of cattle, sheep, pigs, goats, and horses, and even wild animals; while the females also suffer in addition from an implication of the teats and udder. In Britain it has rarely been observed in other subjects than cattle, sheep, and pigs. Some years ago the writer observed a mild attack in a horse* which stood in

* “Prize Essay on Murrain. Highland Society’s Transactions, 1865.” A similar event has occurred recently in the practice of the Editor. His attention, as Veterinary Inspector of the Linslade Division of the Cottesloe Hundred of Bucks, was

the cow-house of a town dairyman, among whose cows the disease had appeared. "Actæon," a writer in the "Veterinary Review," * records several cases which he observed in horses under his care. Others have also been chronicled, but distinct references are not at present forthcoming.

Symptoms.—These are variable; doubtless modified by the habits and temperament of the animal, as well as mode by which the poison has been introduced.

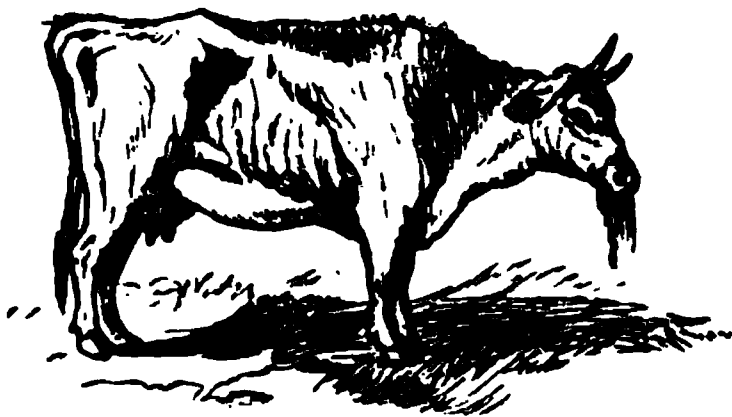


FIG. 51.—*Epizootic Aphtha or Foot and Mouth Disease.*

A brief period of incubation occurs, which may occupy not more than twenty-four hours or extend to three or four days. The various stages of the disease are generally confounded, as they so closely run into each other that no practical distinction can be made. We shall, therefore, enumerate the different signs as they occur, and adopt the generally accepted view of a common and an aggravated form.

The early signs are a shivering-fit, succeeded by slight dul-

directed on the 27th October, 1869, to a number of cows on the farm of Mr. James Stone, at Hollingdon, near Leighton Buzzard. The animals were found in a home paddock, and with them a chestnut harness mare, and, upon examination, were found to be affected with epizootic aphtha. The mare being described as off her feed, and having "drivelled" for a day or two, she was also examined, and her tongue, with the inside of the lips, gums, &c., were observed to furnish the usual aphthous crusts and ulcers characteristic of the affection, and in as intense a degree as suffered by bovine animals themselves. Various accounts of human beings suffering also from aphtha have gone the round of the papers during the late visitation, which, if true, corroborate the observations of medical men and veterinarians who have reported thereon some years ago.

* Vol. III., p. 329.

ness, staring coat, husky cough, elevated temperature, with increased frequency and hardness of pulse. . If the animal is in the pasture, she will, in all probability, be found away from her companions. The appetite is capricious, tenderness is evinced upon pressure over the back and loins; febrile signs are present, and an increased flow of saliva takes place, which becomes ropy from an admixture with mucous; and an uneasiness is evinced by frequent movement of the jaws. If the mouth be examined, vesicles will be observed on the tongue and membrane generally. These vary in size from a pea to half a crown, and in a few hours burst their contents with an

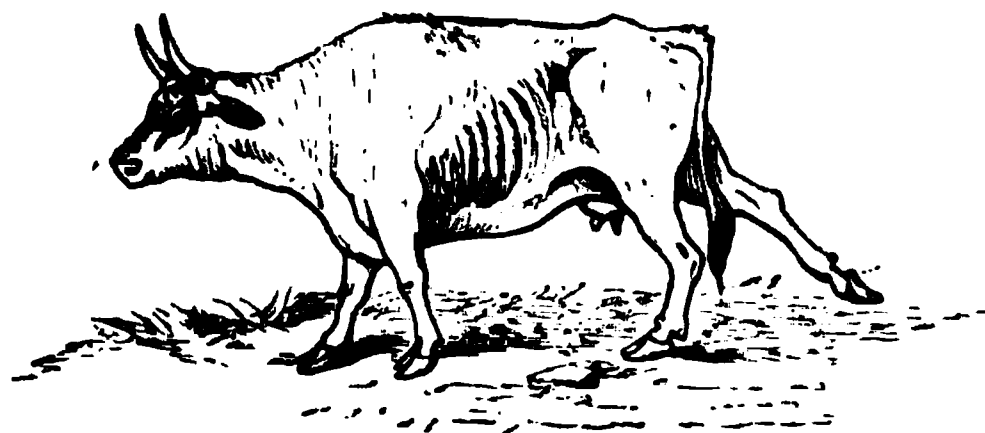


FIG. 52.—*Epizootic Aphtha. Indications of the Feet being affected.*

admixture of blood, giving colour and consistence to an aggravated flow of saliva, while the raw and sensitive surfaces cause great pain and smacking of the lips.* In some instances the feet are attacked, and this may occur before any signs of disorder appear in the mouth, or not be observed except in conjunction with or until that period has passed. When vesicles form on the coronets and between the digits, great pain and swelling accompanies the disorder; the animal kicks, or shakes the feet when made to walk, or lies persistently, and suffers for a time from acute fever. The vesicles soon burst, and discharge their contents, and the various surfaces are possessed of an increased sensitiveness, while severe lameness adds greatly to the embarrassment.

* See Frontispiece.

In ordinary cases the raw surfaces are speedily covered by epithelium, their sensitiveness rapidly decreases, the lameness and flow of saliva gradually disappears, the pulse becomes slower, fuller, and softer, breathing regular, temperature gradually falls to the standard of health, the appetite returns, and general functions restored; except, perhaps, the milk, which frequently suffers permanent diminution; and from the tenth to the fifteenth day after the attack the animal is convalescent. This is the course of common cases: we have now to notice the aggravated forms.

Milch cows frequently suffer violently. In addition to the ordinary signs already observed, the surfaces of the teats and udder are involved in the vesicular eruption; the gland within is also affected by the animal poison, and is hot, tender, and swollen. In the process of milking, or through the sucking of the calf, the vesicles are burst, raw surfaces are exposed, and the operations prove a source of irritation which the animal resolutely endeavours to avoid. This leads to a retention of milk within the udder, and it becomes an additional cause of irritation, and even inflammation. In common with the ordinary febrile signs, pain and agony consequent upon the disease located in the mouth and feet, the lungs are apt to become congested, breath foetid, eyes bloodshot; sloughing of parts within the mouth, and even on the lips and within the nasal passages, occurs, and blood is mixed with the discharges; abscesses form in the udder, sloughing occurs also there, or portions of the secreting parts are destroyed by the deposition of lymph, becoming what is termed "a blind quarter." In other instances mortification takes place, and the part comes away. The feet suffer no less: swelling, inflammation, sloughing, &c., proceed, and expose the bones, &c., beneath, while all attempts at reparation are slow and abortive. During the development of these states the animal loses condition rapidly; the assimilative organs are more or less involved, and nutritive material

is no longer passed into the blood ; it therefore becomes thin and watery, and, in consequence, the heart-beats are heard as unusual sounds at some distance from the side of the sufferer. The pulse is rapid, small, and feeble ; it at length grows indistinct and imperceptible, and a condition of hectic is established, the animal suffering from diarrhœa, and often suddenly dies at periods varying from one to two or three weeks from the attack.

Young animals drawing their nourishment from the teat suffer acutely from the disease attacking the mouth, fauces, gullet, and digestive canal throughout. They then can take no food, and weakness becomes excessive. Colicky pains with diarrhœa and violent straining are the prominent signs, in addition to the eruption in the mouth and upon the feet, from which the little creature succumbs in a few hours. Under these circumstances milk supplied to other animals should if possible be boiled, by which its pernicious properties will be destroyed.

Sheep lose condition rapidly, in consequence of the power of mastication and locomotion being interfered with. Sloughing is common, particularly about the feet, when not only the hoofs, but even the whole feet, bones, and ligaments, are cast off, and the poor creature moves about on the knees or a stump.

Pigs suffer in like manner. They scream violently when caused to move, a sore cough is generally present, and erysipelatous swellings take place over various parts of the body, and death terminates in violent and painful diarrhœa.

In the aggravated form in all animals the tendency to a low type of inflammation, formation of large abscesses over the body, mortification, sloughing, &c., are common states. Condition, therefore, is greatly sacrificed if death is averted, and the prospects of the proprietor, particularly with milch cows and sheep, are almost destroyed. Pregnant animals of all kinds

abort, and months after the attack, when they are expected to yield a remunerative return for the previous outlay, the large owner finds himself in a state merging on ruin. The condition and health of the animals are sacrificed, the milk of dairy cows has been lost, the grass and other food has been consumed, land occupied, labour and supervision demanded, rent, taxes, and wages, with numberless expenses, have to be paid, and nothing is left but a creature resembling a skeleton, whose death at the commencement would have been rather a profit than otherwise.

Treatment.—Epizoötic aphtha imperatively calls for alleviative treatment. To entertain an idea that the disease can be *cured* is nothing less than absurdity. As in epizoötic pleuropneumonia, the attention should be directed towards mitigating the sufferings of the animal. To these particulars we therefore draw attention.

In the simple eruptive form, as soon as the vesicles are observed, let each receive a drench composed as follows:

RECIPE NO. 43.

Take of Epsom salts	8 oz.
Ginger and gentian powdered, of each.....	2 „

Mix these with $\frac{1}{2}$ lb. of treacle and a quart of strong ale, and give to a large cow, &c.; three-fourths or one-half may be given to lesser animals and year-olds; one-third for calves up to eight or ten months; and one-fourth for sheep. This is of great consequence: large doses must be avoided, as purgation cannot be endured.

The mouth is to be washed twice daily with the mixture thus arranged:

RECIPE NO. 44.

Take of alum in fine powder	1 oz.
Tincture of myrrh	1 fluid oz.
Water	1 qt.

It is a good plan to open the vesicles as soon as possible

with the knife or lancet, by which the healing action is more actively promoted, and greater benefit derived from the application.

If matter forms in the neighbourhood of the hoof, all detached portions should be carefully removed, and the parts dressed daily with a mixture compounded after the following arrangement :

RECIPE NO. 45.

Take of tincture of myrrh	2 oz.
Butyr of antimony	1 „

Mix, and apply to each sore by means of a feather, or piece of tow placed upon a stick. In the hands of the practitioner various compounds are improvized with the mineral acids, metallic astringent salts, &c., &c.

If weakness supervenes, diffusible stimulants, as ammonia, brandy, &c., must be given, in which a little ginger and gentian should be placed. When febrile symptoms prevail, small doses of the sulphate or nitrate of potash are usefully combined with tonics, in the following proportions :

RECIPE NO. 46.

Take of sulphate or nitrate of potash.....	$\frac{1}{2}$ oz.
Sulphate of iron	2 drs.
Ginger	$\frac{1}{2}$ oz.
Gentian	$\frac{1}{2}$ „

Mix, and give daily, or morning and evening, according to circumstances, in porter or ale.

Promote the maturation of abscesses by hot water, poultices, blisters, &c. ; keep all suppurating surfaces clean, and apply such dressings as are here given.

RECIPE NO. 47.

Take of chloride of zinc.....	2 drs.
Tincture of myrrh	1 oz.
Water.....	1 pt.

or,

RECIPE No. 48.

Take of crystallized carbolic acid.....	$\frac{1}{2}$ oz.
Glycerine	6 „

Dissolve, and add

Tincture of myrrh	1 „
Water.....	1 pt.

or,

RECIPE No. 49.

Take of solution of permanganate of potash or Condyl's	
Fluid	a tea-cupful.
Water.....	1 qt.

This must be compounded as required, and is useful for destroying the smell, as well as promoting the healing action of wounds.

As soon as the animal is able to take nourishment, hay-tea should be liberally provided; mashes of barley, malt, oats, with a little linseed to promote the proper action of the bowels, are also of absolute necessity. When they can be had, green clover, grass, carrots, swedes, &c., &c., are also valuable; in fact, whatever can be taken to furnish support should be allowed, having due regard to nutrition, easy digestion, avoidance of constipation, or overloading the stomach, &c.

The cleanliness and ventilation of buildings, with good beds, should especially be provided, and, in order to protect the spaces between the digits from irritation, as frequently occurs by the insinuation of straws, dirt, &c., &c., the feet may be bound up after being dressed by rags, &c., as shown in the accompanying drawing.

When the udder is affected and the abstraction of milk



FIG. 53. — *Mode of applying Dressings between the Hoofs.*

difficult, insert the teat-syphon in order to empty the gland without aggravating the pain and inflammation by the motion consequent upon employing the hands only. Afterwards inject



FIG. 54.

by means of a glass syringe (see Fig. 18) a weak alkaline solution, such as is given below, in order to neutralize the acidity consequent upon the morbid action within.

RECIPE NO. 50.

Take of carbonate of soda or potash.....	$\frac{1}{2}$ dr.
Water	8 oz.

Mix, and when dissolved the solution may be used. It is not necessary to inject a large quantity, the syringe discharged once or twice being sufficient for each teat. A little practice is necessary for the operation, as the movements must be

FIG. 55.—*Method of injecting Fluids into the Milk Gland.*

delicate, otherwise total failure results. The syringe being filled, the teat is carefully held between the first and second fingers of the left hand, so as to turn the point and orifice

towards the operator. The syringe is held in the right hand between the first and second fingers, while the thumb rests upon the piston-rod in order to push it downwards. The point of the syringe is then placed lightly upon the orifice of the teat, and by pressure emptied, the fluid passing readily into the gland-ducts.

If the udder is much inflamed, common elder ointment with camphor may be rubbed in upon the outside. The extract of belladonna also is an efficient remedy. It should be thus compounded :

RECIPE NO. 51.

Take of extract of belladonna	1 oz.
Hog's lard	6 „

Mix by means of a spatula on a marble slab, and anoint the parts daily, with as much friction as can be borne.

Indurations may be treated afterwards by iodine or mercurial ointment, as preferred.

Post mortem Appearances.—These are variable, and result from the course the disease has pursued during life. Epizoötic aphtha alone rarely kills animals; death usually results from a combination of causes, other organs being attacked.

In those subjects that succumb from epizoötic aphtha, the immediate cause of death lies in the great prostration of nervous power consequent upon the inability to take food and nourishment, and loss of absorbent as well as assimilative action. The muscles of the body are pale, soft, and flaccid, besides being wasted; the absence of fat is also remarkable, and the blood is thin, watery, and dark coloured. The bowels are empty, and patches of ecchymosis, that are present here and there, stamp the true nature of the affection. The mucous membrane extending throughout the alimentary track, from the mouth, fauces, along the gullet, even to the fourth stomach and small intestines, exhibits ulcerated spots, the removal of

epithelium in some places being extensive.* In some milder cases, the mouth only being affected, weakness probably being great at the commencement, the only signs of disorder in the abdomen is an impacted third stomach, in which diarrhœa is of course not present. Extreme or protracted cases exhibit complicated disease of other organs, as the liver, lungs, spleen, brain, and spinal chord, or probably most or part of these, abscesses being found as a result of pyæmia or the absorption of pus. Gangrene is then not uncommonly present.

Communicability to Man.—Epizootic aphtha is readily transmitted to the human subject by the milk of diseased animals. Dr. Balfour and Mr. H. Watson, M.R.C.V.S. Coldstream, have adduced positive proofs.† Numerous instances have also come beneath the observation of the writer, in which the disease has been transmitted to calves and pigs by the use of milk from affected cows ; and Mr. C. Hunting, M.R.C.V.S., Hetton, Durham, states that during the prevalence of the malady in 1862, he observed fowls in the farmyards suffering from aphtha where diseased animals were present.

The malady is also communicable to man by inoculation, Mr. J. B. Hislop, F.R.C.S.E.,‡ of Houston, Renfrewshire, having had two cases come beneath his direct notice. Dr. Balfour, commenting on these cases,|| quotes numerous cases in which the susceptibility of man is undoubted.

The poison of epizootic aphtha is transmitted with remarkable facility. Cattle returning from fairs and markets carry it to the buildings of dairymen, farmers, and cattle dealers. The congregation of animals at such places, and their subsequent distribution over the country, is the cause of its spread. The

* In a number of cows, calves, and pigs, which have recently been examined by the writer, the appearances of the stomach and bowels were such that the cause of death might easily be mistaken for Rinderpest itself.

† "Veterinary Review," Vol. IV., p. 502 ; *ibid.*, Vol. V., p. 187.

‡ *Ibid.*, Vol. V., p. 81.

|| *Ibid.*, p. 189.

Editor has known instances of animals becoming affected that have been tied up for weeks, but the cause could be readily assigned to the proximity of a main line of railway and roads, on which diseased animals were continually travelling.*

Butchers who visit cattle-sheds frequently with a view to purchase, farm men going direct from diseased to healthy cattle, dairymaids milking healthy and diseased animals indiscriminately, removal of food, straw, manure, &c., all have been known to convey the disease. Pastures, buildings, yards, railway-trucks, &c., into which diseased animals have been turned, effectually communicate the disease to others that follow, unless sanitary measures have been carried out.

Epizoötic aphtha frequently proves a precursor to other diseases; and when it occurs in a stock of cattle that have been recently purchased, the owner may congratulate himself if, after partial recovery, he does not lose them by epizoötic pleuro-pneumonia. In numerous instances during 1865-66, the Cattle Plague was preceded by aphtha, which not only aggravated existing conditions, but masked the progress of the plague, and delayed the adoption of suitable measures that might have gone far towards arresting the scourge.

The history of the disease dates as far back as two hundred years, but records have not reached us that denote accurate observation before or even since that time. The increasing movements of cattle from East to West have brought the affection as a distinct malady more directly beneath our notice, particularly as such contiguous nations from whom we draw our supplies, as Holland, &c., have suffered and communicated the disease to our own cattle. It was imported to us in 1839, when it plunged the three kingdoms into dismay by the rapidity with which it was carried from town to town. Since that time we have experienced repeated visitations, exhibiting different

* Prize Essay on Murrain. "Transactions of the Highland Society," 1865.

degrees of malignancy and fatality, particularly during the years 1852, '54, '55, '62, and '64, that of 1862 probably being the most remarkable, excepting the recent visitation of 1869.

VARIOLOUS FEVERS, CHIEFLY SPORADIC, BUT OCCASIONALLY EPIZOOTIC.

SMALL-POX IN SHEEP.

History.—This affection was not seen in Britain before the year 1847, when it was imported from the coast of Denmark, or from Holland, and probably also at the same time from Spain. Extensive outbreaks occur annually upon the Continent, which are more or less aggravated by the trade carried on, and the calls for extensive movement of stock towards the ports of embarkation. Russia, Prussia, and Austria probably suffer most; Greece is seldom free, and Germany, Hanover, and Saxony have occasionally suffered; while Holland, Friesland, Belgium, and particularly France, in consequence of large importations annually made, have become powerful centres of the malady. In Prussia it is said to be stationary, and, travelling westwards to Holland, we have received it from thence.

Small-pox has proved fatal in sheep to the extent of 20 to 40 per cent. in France, while in England the mortality amounted to 50 per cent.; and this may be looked for under conditions which characterize epizootic affections when introduced to the stock of a clean country far removed from the home of their birth.

We have but imperfect records in reference to this malady, but from what has transpired we may not be unreasonable in believing that small-pox had visited this country before the memory of the present generation. Since 1567, when first accounts were written, outbreaks of more or less intensity have

occurred over the Continent, from which scarcely a nation has not, at some time or other, suffered very acutely. Spain and Portugal have had cause to regret that Africa offered such facilities by its close proximity, as diseased sheep have readily passed thence, by the Straits of Gibraltar, and spread dismay around.



FIG. 56.—*Animals equally prolific in the production of Contagious Diseases.*

Small-pox is perpetuated in some countries by the practice of inoculation, which is conducted yearly, in order, as is supposed, to lessen the severity of the disease in the locality. It is by animals leaving these flocks so treated—many of the members always suffering—that the disease is so regularly and certainly distributed.

Synonyms.—Sheep-pox is known by various appellations. In technical language it is termed *Variola ovina*, and in the vernacular, small-pox. It is the *Schafpocken*, *Schafpockenseuche* and *Schafblattern* of the Germans. In France it is known as *Claveau*, or *Clavelee*; but *Rugeole* and *Picotte* are terms em-

ployed to denote small-pox. In the Italian language it is called *Vajuolo pecorino*.

Nature.—A malignant and specific variolous fever peculiar to sheep, and occurring but once, as a rule, in the lifetime of the individual. It is rarely communicated to other animals, but when it does occur in them, its characters are those of mildness and evanescence.

Sheep-pox spreads rapidly by contagion and infection ; and from frequent observations it has been decided that a healthy flock is not secure from attack at a distance of 500 yards from affected animals. Like the poison of Cattle Plague, that of small-pox may be carried in the clothes of persons, in fodder, by the skins of other sheep and animals, in hair and wool, &c. ; dogs, vermin, and game also become carriers of contagion. In pastures, stables, railway trucks, in fact, wherever diseased sheep are allowed to go, the virus is left behind and communicated to all that follow.

Where it is the practice to house the sheep a heavy mortality occurs, which increases in proportion to the amount of overcrowding that is allowed. It spreads rapidly in a flock, and few escape ; while the major portion die under these conditions, which are considerably modified when the animals are allowed their liberty, as means of reducing actual contact.

Symptoms.—Sheep-pox is characterized by a period of incubation, which may vary from a week to a fortnight. During this there are no signs of disturbance, and the animal comes under the head of “infected.” Certain conditions tend to modify the incubation stage, and delay the appearance of symptoms. When the disease is induced by inoculation, the earliest manifestations may occur about the third or fourth day, but may be delayed some weeks. Hot weather, and confinement to close, warm situations, eminently favour their development ; but cold, exposure, and other conditions conducing towards a healthy tone of the system, will retard them, and delay their

appearance until the fifteenth or even the twenty-fourth day.

The first signs are those of dulness, succeeded by febrile states: this is the period of invasion. The skin, particularly of those animals but slightly covered with wool, exhibits a

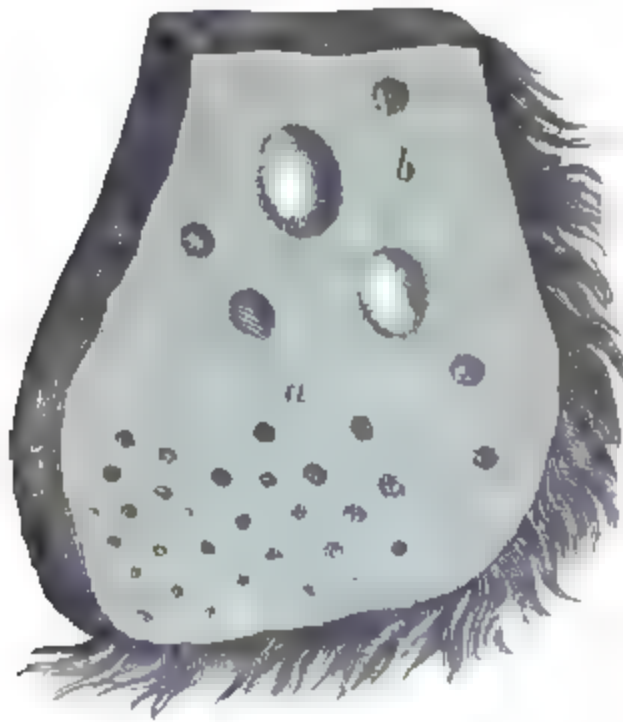


FIG. 57.—*Small-Pox.*
a. The eruptive stage. b. The pustular stage.

"flea-bitten appearance," each spot becoming more inflamed and enlarged, and forming what is known as a papula. This is the eruptive stage. The papulæ then are elevated and transparent from the eighth to the tenth day, and are filled with a clear liquid, which speedily appears turbid, denoting a change from the papular to the pustular stage. The swelling is white at first, but with the changes just noticed assumes a yellow colour and opaque appearance, while the surrounding parts are very pale. Shortly, the elevation becomes diffuse, and the pustule dries up, over which a scab is formed, which, when it falls off, exposes a depression in the skin.

The constitutional symptoms run very high at times, in

accordance with the amount of eruption that takes place. In these cases the papulæ are very abundant, and unite—a condition which is termed confluent. The eyes discharge a purulent secretion; they are bloodshot; and intense thirst tortures the poor creature. The breathing becomes quick; discharge also flows from the nostrils; the mucous membranes assume a blue appearance; breath becomes foetid, and, with the cutaneous exhalation, is almost unbearable. These symptoms

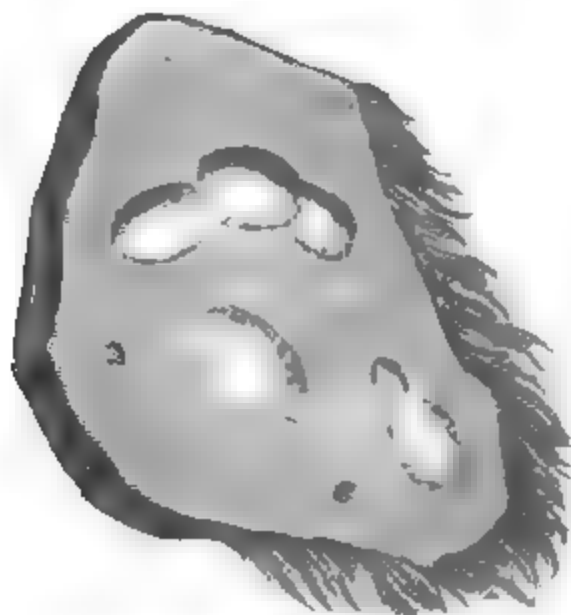


FIG. 58.—*The Confluent Form.*

suffer modification or aggravation, and the animal dies about the eighth day after the eruptions appear, but before the formation of lymph has taken place. It may, however, occur earlier or even later; and mild cases, that are limited to slight fever and a rapid transition of changes, may exhibit approaching convalescence in fifteen days; others are delayed for a month.

Irregular forms are observed, such as the non-appearance of eruption. The fever is intense, strength gone, internal swellings take place, and profuse diarrhœa carries off the animal. The mucous membranes become the seat of the eruption, especially

those of the respiratory and digestive organs, when imminent danger is manifest. The animal breathes through the mouth, and the tongue is protruded. Sometimes disease affects the joints, and the hoofs slough off, and the healing of wounds very difficult if the scabs are too precipitately removed. At other times the vesicles fill with blood, or become receptacles for gaseous accumulations, which result from the process of decomposition, analogous to that observed in Cattle Plague and other malignant affections.

The *Post mortem Appearances* of small-pox are somewhat as follows. The body is considerably swollen from early decomposition, and gives off a very foetid odour; the eyes and nose are usually closed by dry discharges; scabs of dried pustules stud the lining membranes, which, with the skin and other affected parts, exhibit the characteristic eruptions. If the wool has not been detached during the intolerable itching that occurs before death, it now easily comes off—sometimes it absolutely falls off. *Vari*, or nodules, occur in the skin and all parts of the body, and are readily seen during the removal of the integuments. These are characteristic, and serve to form a sure guide to the affection when other signs or parts of the body are absent. These nodules also occur upon the mucous membranes of the digestive track. Sometimes they assume the character of yellowish or red spots, and at others ulceration has progressed to some extent. Besides these, the tissue beneath is infiltrated with serum, particularly in the extremities, lymphatic glands are enlarged, inflamed, and covered with red spots.

The *Treatment* of small-pox, in all parts and of whatever kind, has hitherto been attended with results no less mortifying than that which was adopted in Cattle Plague. Medicines, so far as we at present know, throughout the world, have no power of destroying the poison or cutting short its progress; but while animals are allowed to live they breed the poison, and other animals serve to propagate and spread it farther and

wider. Inoculation serves a similar purpose, and has proved as injurious as the disease itself. If, however, agriculturists are desirous of testing the truth of this statement, they will, doubtless, soon have an opportunity. Foreign sheep, fresh from the small-pox districts of Friesland, are now allowed to pass into our markets, and a few were observed only a week or two ago. The incubative stage admits of sheep passing the best and most vigilant inspector at our ports, and we may live in dread of the disease appearing almost daily.

COW-POX (*Variola vaccinæ*).

Various forms of eruption are known to take place upon the udder and teats of cows, and liable to be confounded with true cow-pox. In its original form, as observed in the time of the renowned Jenner, persons milking affected cows enjoyed an immunity from the malignant form of small-pox, to which form of variola the human subject is extremely liable. This led to the process of vaccination, which at the present day is at least of doubtful efficacy, if not of dangerous tendency.

Cow-pox is supposed to have an origin in the vesicle of the horse's leg, when suffering from grease—*Impetigo erysipelatodes*, or, *Eczema impetiginodes*, as it was technically termed. The older farriers are also believed to have escaped the effects of small-pox by their being vaccinated by the fluid products in their treatment of the disease, and their indiscriminate attention to horses and cattle may have been the cause of the transmission of the equine fluid to bovine animals. It, however, appears probable that cow-pox is as peculiar to the cow as small-pox is to sheep, and requires certain influences to establish its development. Spontaneous origin is denied in bulls, oxen, or heifers before calving; but after the conditions are fulfilled in the latter necessary for the provision of the calf, the udder undergoes peculiar changes, and the result is, in this

instance, the production of a variolous fever having contagious properties.

Symptoms.—The animal usually exhibits signs of febrile action at the outset, and after a brief period of incubation, which are closely followed, but sometimes delayed to three or four days, by an eruption upon the udder and teats, consisting of hard red spots, with intense painfulness and moderate



FIG. 59.—*Cow-Pox or Variola Vaccina.*

swelling, which renders milking a difficult and protracted operation. The spots, which are at first about the size of the point of a finger, speedily enlarge, rise in the centre, and form an eminence which contains internally, at first, a clear fluid; but afterwards, by a further process of inflammation, the characters of the fluid are changed to the purulent form; it is, therefore, opaque.

The form of the pustule is characteristic, and requires about ten days to effect a transition to the stage we have named. Around its base or circumference the colour of the skin denotes active erythema (inflammation) by an areola (halo) or circle of acute redness and tenderness. The pustule is light in colour, and depressed or umbilicated at the central point or summit, as shown in the engraving annexed. By the process of milking the pustule bursts, or it may do so spontaneously in some instances, and the fluid is found to have been enclosed in the network of the skin. The pustule dries up, a crust forming upon its surface, having a brown colour, which is thrown off in ten or twelve days more, the parts beneath being red and shining.

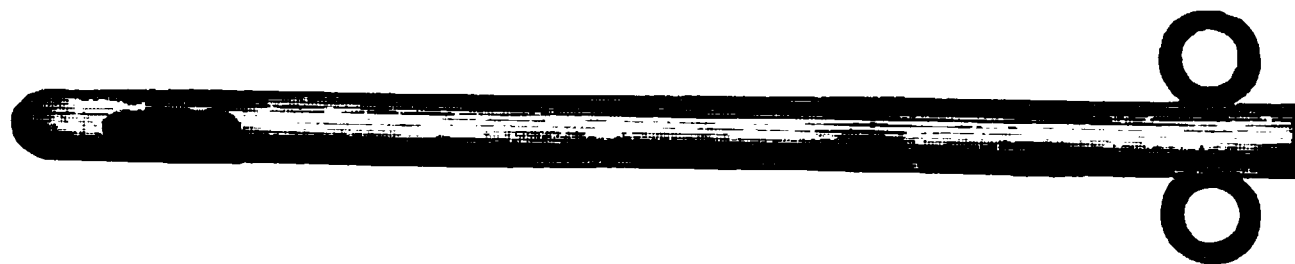


FIG. 60.—*Teat-Syphon.*

In some instances the febrile symptoms, which usher in the eruptive stage, are very severe. As in all exanthematous diseases, the mucous membranes are prone to suffer in the general state of affairs ; the mouth becomes sore, drivelling of saliva takes place, and the cheeks are moved outwards as well as inwards by a partial breathing through the mouth. Abdominal pains are evident ; the animal stands with arched back and feet drawn together, and diarrhœa comes on ; the loss of flesh is, therefore, rapid. These signs characterize the disease in tropical climates, where it is observed in a more malignant form, and death common from its severity.

Treatment.—Segregation of all affected animals, and employment of separate attendants to wait upon them. The teat-syphon (Fig. 60) should be employed to draw off the milk, without the infliction of pain by the ordinary method. When

the udder is greatly inflamed, fomentations and poultices, &c., as recommended for *mammitis*, are necessary; and support, by means of bandages to the affected parts, must not be omitted.

MORTALITY FROM EPIZOOTIC OR CONTAGIOUS DISEASES.

The introduction of foreign cattle diseases, we have said, is due to our system of importation. We must, however, not forget that the first appearance of Rinderpest in 1745, and with it pleuro-pneumonia, also the introduction of murrain in 1839, and about the same time pleuro-pneumonia, were not brought about by the facilities which free trade admitted. It is remarkable that *these diseases made their appearance before the free admission of foreign cattle*, and we gather therefrom the necessity for greater caution during an uninterrupted condition of the supply. Such restrictions as then existed proved the salvation of our stock. Notwithstanding heavy losses took place from cattle plague and pleuro-pneumonia in 1745 and the subsequent years, as well as from murrain and pleuro-pneumonia again in the present century, the country subsequently had time to recruit itself. The disease was imported in small parcels, and could be traced to one point. It was not sown broadcast, as the free admission of cattle a few years later rendered possible. As soon as the ports were open cattle were poured in from various quarters, no regard being paid to the district from whence they came being healthy or the reverse. The constant accession of new virus of murrain and pleuro-pneumonia resuscitated the disease from time to time. Its extension inland by home traffic, and the congregation at fairs and markets, became still more certain; and, in the face of increasing supply and demand, uninterfered with by proper regulations, we feel it would have been an absolute impossibility for the results to have been otherwise.

In the nature of plagues towards the destruction of our domestic animals, public opinion has, unfortunately, been biassed in the wrong quarter. The most deadly plague is not *per se* to be regarded as the most destructive among cattle. We have had palpable evidences of this recently. No less than three plagues have been placed in very favourable contrast, and we learn there is such a thing as an evil in mildness. When the plague called Rinderpest spread through the kingdom, its effects in the space of eighteen months, or a little more, were as a "drop in a bucket," compared with the losses from other plagues having milder characters.

The more active plagues possess signs which are developed much earlier, and are less likely to be mistaken, and measures for prospective benefit are usually more decisively instituted. With those of a milder nature a long period of insidious silence occurs, and the first signs are not always well marked. The period of visible attack is so far removed from the actual cause, that all sequence of events is forgotten or lost; and the proper importance of and necessity for precaution has thus been unfortunately misinterpreted or unrecognized. Few have calculated the indirect losses arising from the invasion of that certainly mild and, comparatively speaking, non-fatal plague, the "Foot and Mouth Disease." Animals, as a rule, did not die, and as long as the carcase was present, mere illness was not estimated as a loss. The loss of time, of money, by useless treatment, of food and pasturage, of milk among dairy cows, of flesh among feeding stock, the unprofitable occupying of buildings and land and employment of labour, the outlay of capital, and long period without compensating return, with the paralysis which the adversity of agriculturists brings upon the commercial part of the community, all this was not calculated.*

*As in a great measure corroborative of the statements given in the context, the following report by the Editor is appended.

Mortality from Epizootic Diseases. 181

With pleuro-pneumonia similar absence of calculative propensity has been remarkable. Where trouble and time has been

“To the Magistrates of the Linslade Division of the Hundreds of Cottesloe,
(Bucks).

“CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

“GENTLEMEN,—The prevalence of epizootic aphtha, or ‘Foot and Mouth Disease,’ having considerably declined in this district, I venture to draw attention to the following statistics and particulars in reference thereto, which may prove interesting.

“My duties as inspector commenced on the 15th day of September last, since which attention has been officially directed to sixty farms, extending over thirteen parishes. Throughout these, returns have furnished that 5,251 animals were within the limits of infection; out of which 1,350 have been attacked by the malady. The latter comprise 16 bulls, 546 cows, 144 oxen, 187 heifers, 100 calves, 270 sheep, and 87 pigs. Among them have died 3 cows, 1 heifer, 6 calves, and 11 pigs.

“Of the sixty farms infected, twenty-eight only possess animals that have escaped the contagion up to this date; but the number represents the major portion of the stock. They furnish 6 bulls, 236 cows, 44 oxen, 104 heifers, 66 calves, 3,206 sheep, and 239 pigs; or a total of 3,901 animals.

“There are, however, eight farms which are still under restrictions; and upon these are, in all, 1,929 animals, which, affected and unaffected, are as follow:

	Diseased	Healthy.
Bulls	3	4
Cows	161	4
Oxen	34	55
Heifers	24	—
Calves	40	13
Sheep.....	6	1,431
Pigs	23	131
	— — —	— — —
	291	1,638—1,929

“These figures show that the animals affected amount to upwards of *one-third* of the whole number—a fact which tells favourably on the system of surveillance in the movement of animals, when contagious diseases are present among them; otherwise, with such a subtle foe, the whole must have inevitably suffered.

“If we look further into the question, we shall discover additional and as great inducements for a continuance of proper inspection. The loss which must occur to farmers, even in this by no means fatal malady, is somewhat considerable; and, if duly considered, would convince many of the absurdity of the system frequently practised, viz., mixing healthy animals with others diseased, that inoculation may speedily follow, and thus secure earlier recovery of the whole, as well as immunity from secondary attacks.

“Contagious diseases are always best avoided, as the following figures will prove. It has been variously estimated that a loss of 20s. or 30s. per head in condition

given to it, strange facts are revealed. Although reliable sta-

ensues upon all bulls, cows, oxen, and heifers during the affection, to say nothing of deaths. This, I think, is below the actual loss. If, however, we conclude it to be 30s., we shall find, in this district, over which my attention has been directed, the farmers have lost on 893 bulls, cows, oxen, and heifers, £1,389 10s.; on 437 calves, sheep, and pigs at 10s. each, £228 10s. The deaths have resulted in a loss of upwards of £100, and these are divided among ten persons. But to these we must add something for loss of milk, keep, occupation of ground and buildings, attention, and medicines given, which incur an additional cost, upon an average, of 15s. per head for larger stock, and 5s. for smaller animals. This will give us a further sum of £669 15s. for the former, and £114 5s. for the latter, making a total of £2,402. These calculations, however, do not include those farms still under inspection, for which a further sum of £511 15s. must be accounted, and out of which the loss will fall principally upon one man, who has had 171 out of the total number of 291 animals seized by the complaint up to this date.

“It is only by a close comparison of the conditions that surround the farmer under contagious diseases among his stock that reliable data can be gained, and conviction ensue; and, after stating the losses in our district as already done, we estimate the whole country to be similarly affected—and this is nearly the case—we shall find that out of our eighty and a half millions’ worth of horned stock alone, not less than *seven millions eighty-three thousand three hundred and twenty-two pounds ten shillings* have been taken from the pockets of agriculturists since the month of May last, which must be paid for in the form of increased price of meat.

“Whatever may have been the results of those severe and fatal maladies, pleuropneumonia and Rinderpest, they are as nothing compared with the devastating and widely-spread nature of the milder, non-fatal ‘Foot and Mouth Disease.’ Pleuropneumonia has robbed us of animals in value to the extent of one and a half millions annually since 1842, and the Rinderpest departed in 1866, after eighteen months’ duration, with a loss of three millions. Slaughter and proper isolation greatly retard, if they do not arrest, their progress; but, in epizootic aphtha, the worst fears are not aroused, and losses ensue without inquiry being made. If, however, farmers will look into the matter, they will gather, as readily as others, the assurance that greater surveillance is needed over the movement of stock inland, during an almost unrestricted importation of foreign animals, before the resulting contagious diseases can be suppressed.

“I cannot conclude this report without expressing my conviction that, in permitting the removal of animals that have recovered from ‘Foot and Mouth Disease,’ the period of ten days, fixed by the Privy Council, is too short a time. A misunderstanding prevails among many as to the proper interpretation of the clause which substitutes the word ‘ten’ in place of ‘thirty’ in section 55 of the Act. It is generally believed, if no other animals are affected during ten days from the last attack, that restrictions are to be removed. It appears, however, in many instances, that upwards of ten days elapse before either the symptoms disappear or convalescence is established, and, under these circumstances, the time is evidently meant to apply

Mortality from Epizootic Diseases. 183

tistics are wanting, we may quote from a parliamentary paper the following, as being near the truth :

“ In 1854 it was estimated that in England and Wales	} 3,422,165
the number of cattle amounted to.....	
Scotland (latest statistics, 1857).....	974,437
Ireland (statistics, 1862)	3,250,396
Total horned cattle in the United Kingdom.....	<u>7,646,998.</u> ”

These figures may be taken to represent pretty nearly the number of cattle at the present time, which, if valued at £10 per head, would realize the sum of £74,069,980. Of sheep we have about 40,000,000, which represent as many pounds ster-

to the period since the *recovery*, not the attack, of the last animal. With this view of the question, I have acted accordingly. Misinterpretation of the clause has, doubtless, been the cause of several secondary outbreaks among freshly added stock that have come beneath notice.

“ I have to state, in conclusion, that a general disposition to afford every information required by the Act has prevailed among the sufferers by the disease where I have been called to visit ; and have no doubt the efforts of Government, as set forth in the Act, are widely appreciated. From the members of the police force—particularly Inspector Sapwell, Linslade—I have received every attention and information ; without which, as a stranger in the district, my inspection must have been much more arduous. Happily, beyond this, their services—with one exception—have not been required.

“ Of contagious pleuro-pneumonia there have been no cases. Of the sporadic or non-contagious form two animals have died ; but these not coming within the meaning of the Act, have not been included in the returns.

“ I have the honour to be, Gentlemen,

“ Your obedient servant,

“ Linslade,

“ GEORGE ARMATAGE, M.R.C.V.S.

“ 6th December, 1869.”

The “ Leighton Buzzard Observer,” commenting on the foregoing report, concludes as follows :

“ With such statistics before us, we need not look far for a solution of the dear meat question ; nor, when properly considered, will the agriculturist longer console himself by the false idea that non-fatal diseases among his stock are things of little or no consequence. We hope the increasing intelligence of the body will cause itself to be heard from one end of Britain to the other on this question, and sue for those conditions under its ministrations to the public wants which, as an important section of our social community, it fully deserves, but for want of union, general education, and modest confidence, it has failed to ask for and enjoy.”

ling; and of pigs we number within a fraction of 5,000,000, which should be worth £1 per head. All these calculations, and doubtless they are rather below than above the actual number, enable us to estimate the net value at £119,069,980. And this is the substance which we expose to the mercenary attacks of foreign plagues almost hourly by our uncontrolled system of free trade. Surely the stock represented by these figures, unequalled in the whole world, is deserving of greater attention.

In the same paper I find the following statement:

“Very startling results are obtained by calculating the losses this country has sustained since the importation of cattle and of contagious diseases. The most recent statistics of mortality to be relied on are those of Scotland for the year 1860, which, on taking the average of stock of all kinds, amounts to 4·89, or nearly 5 per cent. If in 1860 the whole of the United Kingdom had (as I believe it at least to have had) the same rate of mortality as Scotland, in that year there died of disease in Great Britain and Ireland 374,040 horned cattle, having, at the average value of £10 3s. 6d. per head, a total value of £3,805,939 8s.; and if the Mid-Lothian experience of the causes of death be applied to this matter, we may infer that more than one-half the loss was due to pleuro-pneumonia.

“The number of cattle imported in 1860 was 104,569, and their value (at £8 per head) may be estimated at £836,552. It will thus be seen that the number of cattle estimated to have died by disease was 3·57 times the number imported in the year, and that the estimated deaths from pleuro-pneumonia were more than 1·89 times the number of cattle imported. Taking the estimated value, we find that the entire deaths from disease represented 4·5 times the value of the cattle imported, and that the deaths from pleuro-pneumonia represented considerably above twice the value of these imports.

Mortality from Epizootic Diseases. 185

“As one year cannot be considered a sufficiently fair estimate, we may give the calculation for six years ending 1860. The average loss of cattle during this period has been estimated at 4,915, or, over the stock of the three kingdoms, to be 375,850. The estimated total for six years amounted to 2,255,100. The value of animals lost amounted, at £11 10s. per head, to a grand total of £25,934,650. Of this number there died from pleuro-pneumonia considerably above one million during the six years, and these represented a value of about twelve millions sterling. The number of cattle imported during six years ending 1860 was 553,033; their estimated value, at £8 per head, £4,424,264. The loss by disease was four times the number of cattle imported, and by pleuro-pneumonia it exceeded twice that number. The average annual loss among sheep amounts to not less than 4 per cent. In Ireland it amounts to 5 per cent., and exceeds this in Scotland. The money value represented by the deaths over the whole kingdom is, therefore, not less than £1,600,000.”

During the time in which the Cattle Plague carried on its devastating effects within the municipal boundaries of Glasgow, 763 animals were sacrificed, representing a loss of £8,957 10s. This is the result of one year's experience. From other diseases the losses have been spread over a term of seventeen years. Thus, from pleuro-pneumonia we have a total of 3,759 cows which *died*, and a further number of 1,594 *sold in consequence of being affected*. The money value of these is estimated at £54,677. One dairyman of the number states that he has lost animals annually amounting to £300 for years.

From murrain, or Foot and Mouth Disease, a loss of £7,314 occurred; from puerperal fever, 637 cases are recorded, which represent £7,021 9s.; but these by no means come up to the exact losses, which are in reality greater.

In Glasgow there are 224 dairies, and the period of the

business operations averages twelve years. The proprietors of these collectively lose the nett annual sum of £5,166.

The accuracy of these figures cannot be questioned, as they have been furnished by the proprietors themselves. The fault which is attached is their insufficiency, as several proprietors refused, or were unable, to quote their losses. However, what applies to Glasgow also obtains with equal force to London and all other large cities and towns and districts where cattle are bought in. The animals are as numerous there as in Glasgow, and we need but exercise a simple rule in arithmetic to estimate the losses which occur over the United Kingdom. Whatever may have been said against these facts was not advanced with direct knowledge of their inaccuracy, but under pressure of motives representing so much personal interest. It was, and is now, in many quarters, deemed advisable to oppose legislation affecting the trade in foreign animals upon those grounds alone ; but it may be now asserted, without fear of contradiction, that by far the greatest number of those interested at all in the question are desirous of seeing such measures adopted as will at all events mitigate, if not banish, the evils in attendance upon it.

Can it be conceived that any department of our import trade of such magnitude should, in common honesty, be allowed to proceed further, with such disastrous evidences before us ? And more, I would ask, is it safe policy, for the sake of pecuniary advantages accruing to the few, that our agricultural community should continue to be harassed, and its wealth and pride manaced, by an uncontrolled freedom of that few ? Surely the magnitude of the affair would more than counterbalance the argument raised on the plea of " Let us alone ; " and the resulting satisfaction, security, and peace of mind to the nation, as well as individuals, from regulated importation, sufficient to establish the justice and rectitude of the proceeding beyond all manner of dispute.

MEASURES REQUIRED IN ORDER TO PREVENT, AS FAR AS POSSIBLE, THE INTRODUCTION AND SPREAD OF FOREIGN CONTAGIOUS DISEASES.

A discussion of the principles by which all diseases among our domestic animals are to be prevented would occupy too much time and space at present. It would also be without the scope and object of this work. We therefore confine our remarks to the measures required to oppose the introduction and prevent the spread of those contagious diseases imported with foreign cattle.

Any interference with this department is regarded by individuals as a disturbance of invested rights and privileges which are watched with very jealous eyes. Any proposal for amelioration is prospectively viewed as inimical to or totally subversive of the whole trade. Alterations are seen only under conditions which assume a magnified and aggravated appearance of total annihilation. In short, whatever defects may hang to the proceeding, however prejudicial it may be to the profits of the many, the few rigidly declare their aversion to be placed and maintained in a line of rectitude, and do not forget to exhibit a spirit of resistance when requested to conform to a necessary system of political safety and plain dealing. Throughout all the opposition to the attempts at providing necessary legislation, the arguments have been unsound, far-fetched, and prompted only by selfish motives. The great spirit manifested is that of "Let us alone! What have you to do with us? We are benefiting the nation by our supplies, and you have no right to question our proceedings!" The existence of evil is too plain to admit of doubt, and, while admitting it without alternative, they do not advance the least help to avert the difficulties.

On the necessity for legislation in the matter there is no doubt. While the demand for foreign animals continues, their

introduction must be regulated on principles consistent with the safety of our home stock. It is not a question to be lightly set aside. The evils which attend the importation of stock are numerous and prospectively serious to our nation, and require close attention; and any proceeding which will not bear the imposition of regulations calculated to promote the public good must be based upon a rotten foundation. There is no justification in one person carrying on a special calling which shall sap the resources of many others, because it is *his* living. The whole affair is not of many years' growth. It has been raised on the prospect of demand and ample remuneration; and while acknowledging the rights of the supplier, the consumer can surely claim respect to his. It is no argument which claims a right to resist an improved legislation for a practice which has proved to be not only defective, but injurious, and sanctioned by powers which were unable at the time to comprehend the exigencies of the case. Acknowledging, therefore, the defective state of the principles which wait upon and govern the foreign cattle trade, the nation has wisely come to the determination of having an improved legislation in the matter.

The establishment of the foreign cattle trade was undoubtedly due to the scarcity of British stock, which, owing to the continued prevalence of enzoötic diseases, had suffered considerable decrease. Farmers ceased breeding, preferring to purchase yearlings or half-fed animals, by which their risk and losses were diminished. The trade with foreign countries was commenced by a repeal of the prohibition on the 9th July, 1842. Hitherto only a few animals had been introduced, and these in isolated instances, for breeding purposes. A duty, however, continued of 20s. a head on oxen and bulls, 15s. on cows, 5s. on pigs, and 3s. on sheep, until 1846. The importations did not average more than a little over 7,000 head during the four years, and the anticipated reduction in the price of

butchers' meat was not realized. In 1846, therefore, the duty was taken off, Sir Robert Peel having regarded the imposition as inimical to the wants of the population, and in that year the imports suddenly rose to upwards of 17,000 oxen and bulls, 25,000 cows, 2,000 calves, 91,000 sheep, 2,000 lambs, and 3,000 pigs.

Although an increase has taken place in the annual imports, it has not been so great as would be supposed, not quite 70,000 cattle being brought in 1862. Even in some subsequent years, notwithstanding the great increase of population, the number of imported cattle has not been remarkable, a little over 227,000 being imported in 1865; and in the face of all this, almost fabulous prices are being paid for the meat so much required. To this we owe the importation of cattle, and it should be a cogent reason, after near twenty-seven years' endurance, for an attempt at amelioration.

The constantly extending railway system abroad will as constantly offer facilities for dealers penetrating the interior of the plague-stricken countries, as the supply near home falls short. The improved system of steam navigation and extension of our own railway system also affords a most marvellous rapidity for transit, and hence we may expect to feel as insecure as heretofore. Under present regulations, the plague countries of Russia may contribute, the regions of small-pox, aphtha, and pleuro-pneumonia be as active in the supply as ever, and we know not how far distant may be a second visitation of the recent plague.

While British stock is being decimated, and the demand for meat unsupplied at home, while prices are so tempting, the cheap animals of the Continent, and the remnants of diseased herds, offer facilities for the building of large profits from the speculation which a defective system of importation acknowledges and offers admission to our shores.

Such animals, some under the name of "fatted," gain access

to our markets—with others termed “stores”—and these stand side by side with our own, to which they communicate their diseases. The return from fairs and markets to farms and cow-sheds contaminates railway trucks, roads, and buildings, and spreads dismay around. Our town dairies have become nurseries for aphtha and pleuro-pneumonia. Where scores of calves were once born and reared, and cows continued to yield a supply of milk for years, the former are sold to the butcher, and the latter, if she happens to bear a calf, which is rare, is sold in a few months with both lungs diseased.

The constant presence of disease of this kind not only affects the dairies, but even districts of farmers, where cattle are suffered to move to and fro. Their carcasses also find a ready removal by a set of low dealers, who are as great and powerful a means of spreading disease as the animals themselves. We have known these men purchase whole herds of cattle, remove them to a field which they hold, and have built upon it a suitable building for slaughter. Here the carcasses are dressed and removed to the London or nearest dead-meat markets, and not a few pass muster. Others contribute in a different way to the sustenance of the population. The carcasses are boiled down for pigs, which, in the neighbourhood of Edinburgh, Glasgow, and other large towns, are kept in large numbers, the premises not being understood to be situate within the police boundary, or yet called a “slaughter-house,” while it is caused to do duty as such to the public detriment.

Up to the present time legislation has had reference only to two contagious affections practically, viz., small-pox in sheep, and Cattle Plague. True, the Act of 1848, on which all the Orders in Council of 1865 and 1866, with the amended Acts of 1866, are founded, clearly states its purport is “to prevent the spreading of contagious or infectious diseases.” In reality, however, it is almost futile. The rapid character of the transit ensures animals being taken from the midst of a herd of

diseased animals abroad, and exposed in British markets without the least appearance of disease upon them. No one, be he ever so skilled in detecting disease, can swear to animals under infection. It is a direct impossibility, and, therefore, never can inspection at the wharves and in our markets have any material benefit in arresting the spread of contagious diseases while it remains unaided, as it is, by other powers, and confined to such narrow limits.

We have known a market vigilantly looked after day after day, and the condition of the cattle to be faultless. Yet the cow-houses in the town, actually replenished from the stock exhibited there, were decimated by pleuro-pneumonia, the last arrivals being the first to succumb.

Inspection will answer well when the active signs of disease are to be seen, but in other cases, excepting the infliction of a *very little* terror among evildoers, its sole benefit appears at present merely a provision to legally pension off a few favourites.

The mode of accommodation on board our cattle vessels is also very defective. We have seen the animals crowded and huddled together below-deck, some dying, others dead, and more fainting from the excessive heat and want of ventilation, with stifling emanations from dung and urine. In the hold of a vessel plying between Dublin and Glasgow, the writer ascertained the following particulars: The space occupied by cattle was 40 ft. in length, 26 ft. in width, and 7 ft. in height. In this place were crowded 48 three-year-olds—Irish crosses of fair size—several of which before being landed had to be revived by means of “fanning” them, which the drovers did by means of their caps. The temperature was 91° F., and the odour penetrating and stifling. The accommodation thus afforded to each animal was the large space of 160 cubic ft., or little more than 1½ times the size of its own body. In this way animals, in our own personal knowledge, during two years,

have been brought from Ireland and landed at Glasgow, upon whom it was decided that no disease of a contagious nature was present, yet in a short time the animals have died, and soon after followed by others to whom they had communicated epizootic pleuro-pneumonia. We have in possession numbers of letters from veterinary surgeons who acted as inspectors in various parts of the kingdom during the operation of the restrictions required by the Orders of Privy Council on account of the Cattle Plague. They were written in reply to questions put by us to test the efficacy of those restrictions, and the existence as well as cause of pleuro-pneumonia in England and Scotland. They in each case prove the benefit which accrued from the limits placed on the movements of stock, and trace the increase and prevalence of pleuro-pneumonia, since the Cattle Plague, to the dispersion of Irish cattle over the country. There is here, then, another difficulty which has to be taken into account in legislation. There the law prohibits the exposure in fair or market, or shipment of animals to England and Scotland which are known to be diseased. But of what use is the order? As soon as a farmer there finds he has the enemy among his stock, he kills the diseased animal and sells the rest. And who can blame him, or say they are diseased? Here they come, and being bought up, travel from fair to fair, or market to market, and, suffering many privations, at length reach their destination. Time passes on! The period of incubation of the malady is exhausted, and symptoms of disease appear, which furnish employment in various ways, and serve to spread the affection wider and wider.

And what does all this prove to us? Does it proclaim an insufficient machinery, and an imperfect working of the same? or is it an evidence of inattention and gross carelessness? We believe not. We believe most of the inspectors who comprise the staff are honest and zealous, but that their circle of operations is too narrow and circumscribed to be productive of

the good we have a right to expect from the expense that machinery costs. Further powers are required, without which we may endure a constant fear and jeopardy, and the hardships which the institution of free trade and parliamentary enactments have in vain attempted to remove.

The Act of 1848 gave power to seize and destroy sheep affected with small-pox, together with pens, hurdles, litter, &c., with which they had been in contact. Penalties could also under it be enforced for exposing diseased animals or diseased meat. Prohibitions may likewise be made against the removal of sheep, horses, cattle alive, &c., or any of their dead parts, excrement, &c.; and it contained provisions for the disposal of the same. The Amended Act of 1866 applied only in the event of the appearance of Cattle Plague, but, it must be said, met one or two points very effectively. Local authorities and inspectors were empowered to be appointed, and the latter were given permission to enter a building at any time where diseased cattle were suspected to be present. Precautionary measures, as segregation and slaughter, were provided for; purification of buildings where diseased animals had been confined could be enforced, and the movement of stock be regulated, or prohibited altogether. The disposal of dead animals by burial, disinfection, &c., and the levying of rates and borrowing of money for compensating losers, were also amply provided for. Yet these measures did not meet the evil of which we have to complain. They applied too much to traffic, and paid too little regard to the disease. We require power and machinery to trace and detect diseased animals, and, while every precaution and provision is taken to prevent such fatal affections as Cattle Plague and small-pox when they gain admittance, let the Act * already in force also apply, with the greatest severity, to the great scourge, pleuro-pneumonia, and likewise to murrain. Why should these be so lightly dealt with?

* Contagious Diseases (Animals) Act, 1869.

they give us the most trouble, and cause the greatest and most constant losses.

The measures calculated to be of service in the extinction of contagious diseases within Her Majesty's dominions, and prospectively to deny them admittance, partake of several forms. To these, and particularly to their adoption by Government in this country, the practices of our free constitution have admitted of great objections being raised. In the matter of invasion by contagious maladies among cattle, our experience of dealing with them was but recent; and opinions freely vented with regard to effective measures even now in many quarters are of a very crude character. As a natural sequence, therefore, many of the objections raised are prompted in accordance as direct ignorance or personal profit from vested interests have prevailed, and to which we owe our recent calamity and those of the past thirty years. The measures we have to consider are :

- I.—Regulating or preventing the importation of stock into Great Britain and Ireland.
- II.—Quarantine.
- III.—Establishment of foreign stock markets and slaughter-houses.
- IV.—Establishing proper machinery, which shall assist and amplify, as well as render more effective, our present system of inspection at our ports, and also inland, which will comprise :
 - a.—Inspection in markets and all dairies and stock farms to which stock is taken.
 - b.—Suppression of the trade in diseased meat and animals.
- V.—Slaughter.
- VI.—Indemnity against losses.
- VII.—Stoppage of fairs and markets.
- VIII.—Sanitary measures.

I.—The Regulating or Preventing the Importation of Foreign Stock into the British Isles.

The restrictions, conveyed in peremptory orders from Government, as applying to the admission of live stock, have in notable instances frequently saved countries from invasions by contagious diseases. Although this statement is valued as only of a foreign nature, we are bound to admit its direct application to ourselves. Ireland owes its immunity from Cattle Plague recently to the orders issued, which prevented importation; and the Channel Islands, together with certain breeding counties in England and Scotland, to their having the facilities of supply and no demand. To this day, also, there exist counties where aphtha and pleuro-pneumonia are never seen—a fact which plainly, but negatively, shows what cattle traffic from abroad and Ireland is constantly doing for us. Is it wise, we may ask, to promote communication between the dwellings of persons, one of which is healthy, and the other disturbed by the presence of a highly malignant and contagious malady? Surely our better sense and increasing knowledge of these matters would counsel greater caution. And, upon similar grounds, is it wise to introduce the infected cattle of a country to those of another adjoining, and which are infinitely more valuable in every way? Common sense would clear aside any hesitation, and enable us to answer boldly, “No!” But vested interests urge that to prohibit importation in any way would be an assumption of arbitrary power, against which a free country would rebel. Then, will you suffer disease and devastation, and spurn the safety to be derived from a wholesome and temporary rigour? Are we to possess no security because a few find it profitable to bring in animals to sacrifice and be sacrificed? The voices of the many must be heard in this matter, or conditions will gradually wax worse and worse.

Our trade with Holland has risen to such a pitch that

capitalists regard it with extreme favour. We owe to it the aggravation of past years. It is no security to us that Holland is said to be healthy. Her supplies are greatly drawn from countries in the interior, and not a few from the very home of contagious diseases. Hungary, Moldavia, Wallachia, and Prussia furnish hundreds of diseased animals, which are sought to consume the refuse of distilleries and starch and sugar manufactories. Let no one consider that all cattle sent from Holland are exclusively Dutch cattle. Railway communication rapidly fills up the gaps made by disease and exportation, and modifies the aspect of trade.

The countries named suffer principally from their proximity to Russia and other fertile sources of contagious diseases, Holland being an indirect participator. Her ports are near to our own, and form a very suitable spot from whence British supplies shall be shipped.

If there were no other countries from whence cattle could be shipped, we might be utterly conservative in our dealings with Holland. But in the face of facts to the contrary, we venture to affirm, if Dutch cattle and those from Dutch ports were prohibited this day, supplies would be so abundant and forthcoming that any inconvenience arising would be scarcely felt. But entire prohibition of cattle importation is not required. Rather, regulate it by closing our ports to all countries where the cattle are suffering from contagious diseases, or kill all the animals immediately upon their landing. Let us take counsel by the acts of France and Belgium, in which the ports were closed immediately after the plague had reached them, and thus, by timely vigilance over their outposts with internal decision, isolated themselves from any further invasion.

The condition of Ireland at the present, as a country from whence supplies are drawn, also calls for some interference. To stop the exportation of animals would doubtless be ruinous; but could not the trade be confined as much as possible to

fatted animals or dead meat? The immense number of dead calves which are sent from thence indicate the little rearing carried on; while the importation of yearlings from hence point to the vast amount of land under pasture. Surely, many of these calves sent over here, which do not realize more than 2½*d.* per lb. in Glasgow, might be made to occupy the pasturage, and older animals could be sent here as beef. Unless some such measures are adopted to include Ireland, and specially applicable to her, we may console ourselves upon slender grounds as to the efficacy of our means for preventing the spread of aphtha and pleuro-pneumonia in England and Scotland.

There is one provision in the Order in Council bearing date 10th August, 1869, as allowed by the Contagious Diseases (Animals) Act, 1869, which, we think, nullifies most of the stringency of previous clauses and sections laid down in the Act itself, and renders their efficacy as salutary enactments of very little value. Clause 1 of Section VII. of the above-named order says:

“If the inspector certifies that all the animals landed from the vessel are free from contagious or infectious disease, they shall thereupon cease to be deemed foreign animals.”

It is thus easy to conceive a cargo of animals arriving from abroad in which the existence of disease is not likely to be discovered by the most acute inspector. The period of incubation is in fact going on, notwithstanding which they are inevitably certified as sound, and shortly are packed on the rail. In process of time they reach York, Leeds, Lancaster, Carlisle, Hull, Glasgow, Edinburgh, &c., unsuspecting farmers and dairymen pass them on to their premises, and suffer discomfort by the breaking out of contagious disease of some kind or other. It is due to the travelling of store and dairy stock over the length and breadth of Britain that such disasters as we now deplore are caused to arise; and the clause referred

to, although taken from an order or supplement to an Act intended to mitigate or do away with existing evils, actually intensifies the evil complained of, by giving permission to foreign *fat* animals also to commit the same prodigious havoc, notwithstanding that certain countries are specially prohibited from furnishing stock, and importers required to furnish evidence of non-contagious disease abroad. Whatever may be the amount of security gained by the two last conditions, the whole, as well as that to be derived from the Act itself, is annihilated by the clause quoted.

It would be far better to restrict the importation to fat stock of all kinds, which should be slaughtered at certain ports of debarkation. Our home stock would not then be exposed to the same perils by disease, and we could replenish our dairies and butchers' stalls by six millions' worth of money, that are now annually squandered to provide material for sacrifice under this foreign invasion. In order to supply the dairies of Britain not less than 40,000 cows are annually imported; we could not only do without these if no disease were brought from abroad, but we should save by the transaction 160,000 of British stock which the foreign diseases kill every year by pleuro-pneumonia alone. What the losses are from other diseases of a like nature we gather from a report furnished by the Editor to the local authority of Buckinghamshire in reference to "Mouth and Foot Disease," already given at page 181.

II.—*Quarantine.*

The difficulties attendant upon quarantine have, in our opinion, been both imagined and highly magnified. It must be understood that under a well-regulated system of importation the duties of quarantine officers would be materially affected. Their services need not be required to impound every cargo which arrives. Their attention would be directed only to those against which, from knowledge previously ob-

tained, there were grave doubts and suspicions. Disease in an incubative stage cannot be detected in animals as they pass the gangway from ship to shore, by any inspector, we care not who he is; therefore it may be necessary to detain such, in order to test the condition of the country from which they have arrived. When that is decided by the results of quarantine, legally official steps would follow, and disaster be avoided.

The imposition of strict quarantine under an imperfect and irregular system of importation would be pregnant with far more evils than have been imagined. It would never accomplish one tithe of the good that is reasonably required when is considered the cost of such machinery.

As fast as cargoes arrive from unclean countries, the system, under present aspects, would entail the greatest demand for extensive buildings, which would be continually found to be inadequate. Contagious diseases would be constantly brought and communicated to others recently arrived, or whose term of restriction was nearly expired. Close proximity, which must be inevitable, would effectually secure transmission and a constant raging of disease; and nothing short of constant erection of quarantine sheds would suffice, by which, in the end, the whole coast of Great Britain and Ireland would entirely be surrounded, and even then prove of no effectual service in the suppression of foreign contagious diseases; on the contrary, it would become a greater evil than that under which we at present suffer, and convert our island into one of barrenness and desolation.

In all those cases where actual contagious disease is observed in the animals, confiscation of the whole cargo should follow, and prohibitory measures be issued at once.

Vested Interest again lifts up her voice, and urges that quarantine and the establishment of foreign stock markets would not only prove no security, but, on the contrary, raise the price to consumers, and act as a medium whereby the

greater dispersion of contagious virus would take place by the movements of officers and butchers, &c. The argument is without interest, for it is only based upon a non-acquaintance with the scientific management of contagious diseases in general, and advances nothing as a disadvantage to the trade.

A proper system of quarantine would greatly facilitate the details of an internal organization of which we have to speak, and afford matchless observation and training for inspectors, all of which would redound to the country's good.

III.—*Establishment of Foreign Stock Markets and Public Slaughter-houses.*

The principle which has admitted of the mingling of foreign stock with our own has been one of the most suicidal acts. We might keep an army of inspectors at our ports and markets, yet they would prove ineffectual in preventing the contamination of roads, railway trucks, and the lairs and stalls of our markets. Likewise they will fail, unaided as they are, to prevent one jot of the suffering and anxiety which must occur if the regulations of the past are permitted.

If the Legislature cannot see it in their power or policy to regulate importation and create reasonable impositions, let us have all the animals slaughtered as they arrive. The system of slaughtering foreign animals, as provided in the Act of 1867, at first met with slight opposition in Glasgow and other places; shortly, however, the harshness of the regulations was forgotten, and the trade continues.

To meet with certain objections which individuals raise, markets for foreign stock should not be established near the ordinary market for home and dairy stock. It would also remove other objections if they were held at a totally different time or even date, and also if the animals were allowed a few days before going to compulsory slaughter. Coming from the deck or hold of a vessel, and particularly after a long or

tedious passage, they are not in the best condition for human food. They might recruit with proper food and lodgment, and, if not sold on the first day, the owner would have another in which to offer them to the butcher.

As an adjunct to foreign stock markets, the establishment of public slaughter-houses is indispensable. Every town should possess one or more. At our ports of debarkation each foreign stock market would require one contiguous to the place of landing, to prevent the travelling of stock as much as possible.

Under present systems, private slaughter-houses, where the proprietors are dishonest, furnish every facility for the dressing of diseased carcasses and their ready dispatch to the nearest or metropolitan meat market. In these places the slaughter of animals intended for human food should not be allowed. They are commonly too small, crowded by other buildings, uncleanly, and altogether unfitted for keeping flesh as food. On the contrary, all animals for slaughter should travel alive to the public slaughter-house, and there be dealt with by the proper inspector.

It is impossible for any man to detect in every carcass the signs of a previously diseased condition. We have known many such, or parts thereof, sent in from outside places to slaughter-houses, but it was beyond the power of man to say whether the animal was diseased during life or not. Some, doubtless, had even died from certain maladies, yet no visible sign was present to prove the fact, and the owner's lips were sealed. Others possessed signs and marks which reason would most probably associate with the weather or mode of packing. At the best, all places where dead meat is sent for sale are only so many depositories at present subservient to an illicit utilization of *diseased* meat. Not long ago, a cow died in consequence of ruptured womb after hours of protracted parturition. The "slink butcher" of the district obtained possession of the carcass, dressed it, and sent it to Newgate Market. Information having reached the inspector of the county town that such a

carcase had fallen into the rogue's hands, he set a watch and traced it to the railway station, and there saw it addressed to a London salesman. The inspector telegraphed to the metropolis to apprise the officials; but meanwhile the butcher had found the powers were against him, and took the first train to London, and in fear and trepidation advanced the tale that he "was afraid the flesh was not good." The inspector, however, had previously said, if no statements to the contrary had reached him, he must inevitably have passed the carcase, which was decidedly unfit for and even dangerous as human food.

As long as dead-meat markets are permitted with slaughterhouses to exist as at present, the traffic in diseased meat and animals will act prejudicially upon the public health and trade, by perpetuating disease in man and beast, and otherwise sapping the foundations of English industry.

IV.—*Establishing proper machinery which shall assist and amplify, as well as render more effective, our present system of inspection.*

a.—*Inspection in markets and dairies and upon all stock farms to which stock is taken.*

b.—*Suppression of trade in diseased meat and animals.*

In this section we propose to deal only with those places or districts to which foreign stock gains access. As long as parts of counties or larger districts observe a distinct relation with regard to cattle—being purely breeding districts—restrictive measures would not be resorted to. But when, by the admission of contagious diseases, such isolation has been broken down, restrictions and regulations should be made to apply.

With regard to inspection at our ports, its security and efficiency would be increased by the collateral measures already named, and therefore needs no further comment here. Our system of home vigilance needs regulation and revision very much. It is one of inutility, and from which no security is

gained, while considerable sums of money are squandered annually for the perpetuation of what becomes in reality a sinecure.

We have known, as already stated, a cattle market inspected regularly, and every cargo of cattle—Irish and foreign—landed there looked at; but, beyond a few sheep whose backs bore traces of having nearly recovered from scab, nothing whatever has been challenged or detained for two years. Yet the dairies of the town, supplied from the market, were cleared of their cattle by pleuro-pneumonia.

Inspection as at present carried on falls far short of its required object. *Before it can minister as it might to the wants of the community, the spot where it should commence is the cow-houses and the many other plague and pest manufactories of the United Kingdom.*

The powers of the Acts of 1847, 1854, 1866, and 1867 should take advantage of it for *all* contagious diseases, and compulsory slaughter—or segregation where the former is not required—enforced by its provisions. It should also be supplemented by the aid of the constabulary in order to trace and arrest the further movements of flocks or herds, when undertaken clandestinely, or, in times of restriction, to examine the authority for the same. This was felt to be a great blow to the operation of regulations intended to arrest the progress of the plague. A man might travel then, as now, with 20 or 100 cattle, and, unless he came within actual observation of the inspector, he was never asked whether he possessed a licence or not, and few forgot to boast of the uselessness of such a document.

Home inspection should also be organized so as to render efficient aid to all stock-owners, without proving a system of inquisitorial severity. The officers should be men—and there are plenty to be obtained—who are raised above all dependence upon private practice among farmers and others, and proof against being bribed to overlook their duty. This, if properly

done, is as serviceable and lasting to the community as the individual, and the best test would be the prosperity of both and the immunity of his district from disease. It should apply not only to contagious diseases, but others of an enzoötic type, which reduce our agricultural stock to no little extent. Instead of being a terror to the stock-owner, properly constituted it would give such aid that the disposition to furnish information would be paramount to any other. It would so materially affect the system of stock breeding and rearing, that the British farmer would feel more secure in himself and against foreign invasions. His stock would increase, its dangers would be materially lessened, his revenue built by substance of his own manufacture, and his dependence upon the foreign breeder considerably lessened or abrogated altogether.

Inspection may do for the farmer and stock-feeder an immense amount of good, even only by a strict principle of surveillance ; but if inspectors are properly qualified veterinarians, and their services are rendered sufficiently obvious to the stock farmer and dairyman, a most incalculable good is to be done.

Disease annually robs our country of six millions of money. This comes from the pockets of the farmers. Three millions of this sum is spread over the losses of sheep and pigs from mainly *preventible diseases*. The other half is equally divided between the preventible diseases and pleuro-pneumonia of cattle. Is not the magnitude of these losses sufficient to inspire more thought and willingness for the conservation of animal life and its representative value in England ? Surely, any sacrifice of ancient custom, even in a free country, would be the natural result of that enlightenment with which it boasts such close relationship.

There are also other matters which would enter into the detail of home inspection. Stock of all kinds going to fairs and markets or slaughter-houses would carry with them a guarantee of their health. The trade of the "slink butcher" would

diminish, and he would be necessitated to seek out, it might be, a more honourable mode of gaining a livelihood. Animals could be traced without fear of error, and districts could be acted upon, without exercising unnecessary rigour, in a most effectual manner for the common good.

Inspection would also take cognizance of all cattle-dealers. There is no reason why rogues and vagabonds should continue to sap the resources of useful callings. The law which compels the man to pay £1 per annum for hawking crockeryware from door to door, and permits a constable to compel him to halt, in common with the auctioneer, and produce his licence, should look into this matter. Why should men be allowed to scour the country and collect all the diseased animals and carcasses that can be found, while the horse-dealer pays no little sum as licence, and men like the above are liable to be questioned at any time? Let the cattle-dealer pay not less than £20 per annum for his privilege, and let him be required, like the hawker and auctioneer, to produce his licence for dealing in and removal of his cattle, and we shall hear less of diseased meat, and more of Britain's freedom from foreign scourges. The carriage of dead meat by road or rail without a certificate of its healthy condition should also be held a misdemeanour.

Suppression of the trade in diseased meat and animals can only be effectually accomplished by collateral internal measures. With it must go the control and inspection of markets, slaughter-houses, cow-houses, and all places where animals are kept, and that inspection must be earnest and performed by practised veterinarians. The trial of tailors, shoemakers, butchers, policemen, *et hoc genus omne*, has proved them to be inadequate to the trust. Let the country avail itself of veterinary science, and we will answer for its efficiency.

V.—*Slaughter and Segregation.*

The slaughter of animals affected with certain contagious

diseases, and others which have been allowed to live in such close proximity as to render their condition dangerous in life and during removal, is a wise and safe proceeding.

All the maladies which are of foreign origin and introduction, save one, are incurable, highly destructive, and not amenable to medical treatment. This has been proved long ago by the eminent veterinarians of the Continent of Europe, whose experience forms a reliable basis for our mode of action.

To attempt to cure is in reality to kill. While animals so affected are allowed to live on, they are continually manufacturing and disseminating the plague-poison far and wide. Judicious slaughter singles out the affected ones, and places a limit to the process of plague manufacture. It is a proceeding warranted in all virulent plagues, and is in the end by far the most profitable. In the milder affections, simple segregation, under proper authority and instruction, may be made to answer similar purposes.

VI.—*Indemnity against Losses.*

The appalling consequences which have met the efforts of the many Cattle Insurance Associations is no argument against the principle of indemnifying owners after losses by contagious disease among their stock. The more we hear of the facts which tell in unmistakable terms the story of their struggles and ultimate collapse, the more convincing do the arguments in favour of a system of insurance become. The fault lay not so much in the system as in its limit. The area of operations was too narrow, and all who entered were considerable losers. Any system, to be serviceable, must at the same time be general. Whether it be met by local rate or poll-tax levied by Government or private individuals, it makes little matter; but all who are interested—and who are not?—must contribute. Losses are confined to particular districts, and on this account their bearings are upon a few. A man may safely insure within

himself his own stock during times of peace and security ; but the weight of plagues is too heavy for any such spirit of internal fortification, and this is at once a cogent reason why a national system of insurance should be established.

VII.—*Stoppage of Fairs and Markets.*

It is sometimes very amusing to learn how opinions doggedly, absurdly, and ridiculously run in a particular vein, and positively refuse to deviate before others of undoubted tendency towards the truthful. When the subject of inspection was first spoken of as a means of suppressing contagious diseases, its application to fairs and markets was the only instance with which it appeared to be associated. Its impracticability was immediately detected and ridiculed, and this was persisted in, to the detriment of the country, as was evidenced by the statements which went before the Committee of the House of Commons in 1864.

The plan was never advocated or recommended as a means alone of securing safety by the proper authorities ; but, accepted under error, it swamped all protestations to the contrary, and we have suffered for it most acutely. Who could possibly believe that inspection among thousands of cattle could be carried out at a fair like that of Falkirk ? yet it was believed in sober earnestness that it was recommended as a specific for a wide-spread evil. The means of detecting disease, however, cannot be carried on amid the rabble of a fair or market, when all signs of partial dissolution are not visible. If such could be unmistakably found under those depreciating circumstances, the aid of science would be entirely at a discount, and tailors and shoemakers would answer all the purposes at once. Other means, however, are required—frequently long and tedious observation ; therefore, under the infliction of severe and malignant plagues, it is wise policy to prohibit the holding of a fair or market. As one of the means of effectually spreading

disease among cattle and sheep, none operate with greater power than the holding of fairs and markets and all other means which admit of their moving over great distances and commingling with each other. The timely stopping of a large fair or market in a locality, and suppression of all traffic within a certain area, even for the short space of two weeks, may in some instances prove the destruction of a virulent plague. As, however, we know the losses which occur from contagious disease, that which is preserved from loss escapes calculation, and the submission to a temporary inconvenience is rarely endured without much murmuring.

Unless an active plague makes its appearance, the stoppage of fairs and markets is not called for. An effectual inspection at home—paying especial attention to proper isolation of all suspected animals and slaughter of those unmistakably diseased, with well regulated importation from abroad—would effectively eradicate our present scourges and restore our country to its pristine health. Let proper attention be paid to the extermination of disease and prevention of fresh introduction, rather than (as in 1865-66) interfere too much with traffic. Neglect of these will not permit of the diminution of ruin that has occurred to thousands.

VIII.—*Sanitary Measures.*

All persons acknowledge the benefits of cleanliness in their habitations, and the admission is also extended to our domestic animals. In disease it is, however, called for more persistently, as being an efficient agent of mitigation, alleviation, and promoting curative measures. Cleanliness greatly arrests the spread of contagion and limits the tendency to other diseases, particularly those of a wide-spread character. Closely allied to *cleanliness* are *ventilation* and *disinfection*.

Close and ill-ventilated buildings create a great tendency towards disease by depriving the system of pure air, which is

essential to health. Good ventilation, providing an abundance of pure air, dilutes poisonous or contagious matters, and thus lessens their effects upon the animal body. This explains how contagious diseases lose their efficacy at a distance in the open air. Strong acids possess powerful action in their concentrated form, but mixed with a great quantity of water they might not be detected. Poisonous miasmata are paralysed in a similar manner.

Disinfection is the act of neutralizing or destroying the products of contagion by processes or substances of a chemical nature. Organic products are generally sensible to the action of chemical agency, and the result is the change or total destruction of their original condition, either by complete withdrawal of the elements of water from them, or union with some of their component elements to form a distinct compound, and in this way their contagious properties are annihilated.

The matter of contagion is supposed to exist in two conditions: *aëriform*, as thrown off by the lungs, skin, or by evaporation of the excretions or secretions; and *solid* or *organic* material, as voided by the excretions. What may be the particular form of contagious *virus* we know not; but of this we are certain—that it may assume an *imponderable* and *imperceptible* state, impregnating the air of buildings, and even of space in the external atmosphere to a considerable extent, and also stamping the dung and urine of affected animals as positively dangerous to all with whom they are brought in contact. Disinfecting agents, then, must be capable of acting upon contagious matter in each of the forms we have briefly described. Their general characters, mode of employment, &c., are somewhat as follows:

1. *Chloride of Lime*, so called, is perhaps one of the most efficient remedies for the thorough disinfection of urine, fœces, &c. It should be thrown over the floor and matters to be purified by means of a large dredger, such as is used for

culinary purposes, and after lying some little time, the whole is carefully swept together, treated with a further addition of chloride of lime, thoroughly mixed, and removed to a proper receptacle. The chloride of lime has one great disadvantage, viz., its strong suffocating odour, which renders its employment among diseased animals, to a great extent, highly injurious. Their original disease may be greatly aggravated, or fresh and severe irritation of the bronchial tubes and lungs occur. On the large scale, and where constant and complete disinfection is required in buildings where animals are confined, chloride of lime is objectionable. In empty buildings it is invaluable. It may be purchased wholesale a little over 20s. per cwt.

2. *Chlorine Gas* is occasionally used for the purification of



FIG. 61.—*Apparatus for generating Chlorine Gas as a purifier of Buildings.*

the atmosphere in cow-houses, &c. It is generated in the following manner: A quantity of the black oxide of manganese is placed at the bottom of a glass flask* and covered with muriatic acid. The arrangement is completed by fixing the flask thus charged in a proper stand, as shown in the engraving, and heating the whole by the flame of a spirit-lamp. A yellowish-green gas is rapidly evolved and pervades the building, the effects of which should be assisted by having previously closed all doors, &c., and otherwise arranged to withdraw as soon as

the process has been put in action.

A more convenient arrangement may be adopted by mixing

* The ordinary Florence or salad oil flasks answer well for the purpose.

the ingredients in a shallow dish, and placing it upon an iron plate which has been laid over a fire in a grate standing in the centre of the building. In these cases, it is understood, no animals must remain, and the process is allowed to act for a few hours, the lamp or fire being charged only to last the prescribed time. Chlorine gas may be liberated in a gentle manner by mixing carefully one part of common salt, one part of the black oxide of manganese, and two parts of strong oil of vitriol together in a saucer or shallow dish. No heat is necessary unless a rapid evolution of gas is required, but the arrangement must be occasionally agitated. For ordinary purposes this answers very well, as animals may remain in their stalls during its use ; but the vessel must be placed at a great height if the air is to be purified, as the gas falls to the floor, being heavier than atmospheric air, and is apt to form a low stratum, and fail to reach the desired ends. *Solutions of chlorine gas* are very useful for washing woodwork and floors. It is made by conducting the gas, as it is evolved from the mixtures given, by the aid of heat through water, as shown in Fig. 33, page 91. Such solutions must be made at the time they are required, as by exposure they are destroyed.

Nearly all the compounds in which chlorine enters are good disinfectants, and are usefully applied in solution to the floors, animal matters, wounds, &c., when properly diluted. These are Chloride of Zinc—*Sir Edward Burnett's Disinfecting Fluid* ; Perchloride of Iron—*Ellerman's Fluid* ; Hypochlorite of Potash—*Eau de Javelle* ; Hypochlorite of Soda—*Labarraque's Liquid*, &c. Their forms of dilution, with ample directions, are given with the fluids as they are sold ; but if the substances are purchased in the solid form from the chemist, they may be dissolved in water, and applied at less expense. An exception, however, occurs with regard to the preparation of iron. That is usually found in a state of solution, and, like the chloride of zinc, may be mixed in the proportion of one or

two ounces to the gallon of water. The compounds of potash and soda are weaker, and require to be doubled or even quadrupled. The prices are—black oxide of manganese, 16s. per cwt., or in small quantities, 3*d.* per lb.; oil of vitriol, 2½*d.* per lb.; muriatic acid, 2*d.*; chloride of zinc, 4s. per lb.; perchloride of iron, 5s. per lb.; the solutions of potash and soda, 4*d.* per lb.

Sulphate of Iron (green vitriol, copperas) may be purchased for about 6s. per cwt., and forms a suitable agent for mixing with the dung and urine. It is used as a powder. *Sulphate of Copper* answers the same purpose, but is more expensive, the common kind being about 20s. per cwt. Used as the above in powder or solution.

The *Mineral Acids*, as the *sulphuric* (oil of vitriol), hydrochloric (muriatic acid or spirit of salt) and nitric acid (*aqua fortis*) are efficient disinfectants for the floors, woodwork, and fœcal matters, &c. They may be used in the proportion of half a pound to a gallon of water, and, like chlorine, its compounds with the sulphates of iron and copper *should not be used in metallic vessels*. An earthenware pan may be appropriated to mix them, and a smaller one for throwing the mixture over the floors, &c.

In addition to chlorine as a fumigating agent, *Sulphurous Acid* is most effective. It has the great advantage of being easily prepared, and at a trifling cost. All animals, harness, rugs, metallic utensils, &c., must be removed from the building to be fumigated, as the gas is both corrosive and deadly. A few hot coals are laid upon the floor between two or three bricks. A plate of iron is then put across the flame, reaching from one brick to the opposite, and a handful of the flowers of sulphur is placed in the centre. When the plate becomes hot, the sulphur ignites and burns with a beautiful blue flame, and continues until consumed. The building must be closed effectually, and all holes filled, to prevent the escape of the

gas, and after three or four hours, may be cleared by throwing open the doors and windows before any one enters. Sulphurous acid may be liberated in small quantity from burning sulphur by means of an apparatus of simple construction, as given in the adjoining figure. A small tin bowl, about half a small tea-cup in capacity, is supported on two or three pillars of the same material, joined to a circular plate at the bottom. Less than half a tea-spoonful is put into the centre of the bowl, and a spirit-lamp is put beneath upon the circular plate; gas is quickly disengaged, the quantity being regulated by the size of the wick, which being drawn out or pressed downwards before the light is applied, gives a greater or less flame as required. By this arrangement the gas may be generated in a very safe and gentle manner in buildings where animals are confined, and to such practice the writer believes is due much of the power recently manifest in preventing the spread of Foot and Mouth Disease.



FIG. 62. — *Arrangement for disengaging Sulphurous Acid Gas.*

Creasote and *Crystallized Carbolic Acid* are sometimes used for fumigation on the small scale during the presence of animals. Being volatile, they are placed upon an earthenware plate, and laid over a vessel in which water is kept up to the boiling-point, when the air is quickly impregnated with the vapour, and contagious matter doubtless greatly destroyed.

Probably the most efficient method is to use the spray-distributor, a form of which is given in the accompanying engraving. The agent is here used in solution, being put into the bottle which is held in one hand, while the other is occupied in forcing the air through the tube by compressing the India-rubber ball at the opposite end. Solutions of chlorine or sulphurous acid gases, mineral acids, or the various disinfecting

fluids are used in the same way, and the atmosphere of a building thoroughly purified. The applicability of such an instrument needs only to be understood to be appreciated,

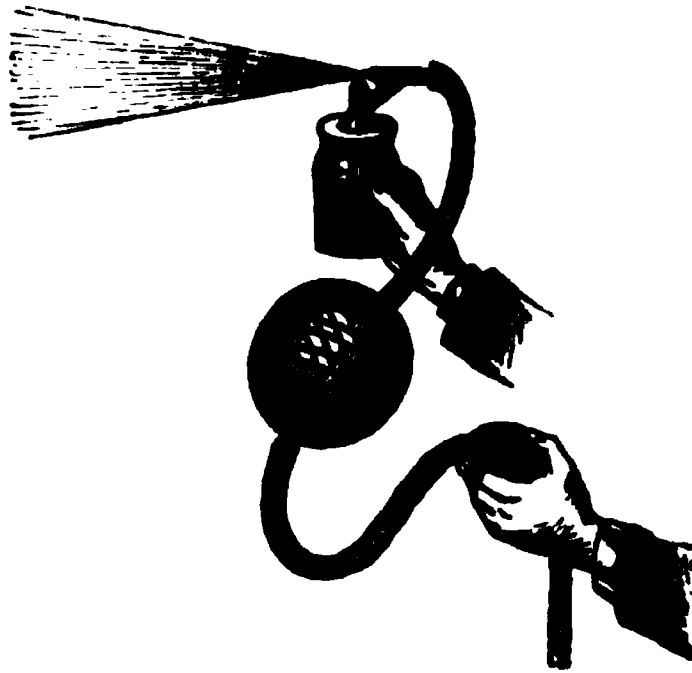


FIG. 63.—*The Hand-ball Spray-distributor.**

and brought into general use, not only in stables and cow-houses, but in human habitations, hospitals, &c., or wherever the purification of an internal atmosphere is required.

Fluid Carbolic Acid.—An impure solution of carbolic acid is now sold at about the rate of 3s. 6d. per gallon, which suggests an extended use as an effective disinfectant. Poured from the rose of a common watering-can, it may be used to the floors of buildings after dilution with an equal weight of water. Rugs, cloths, sacks, harness, and stable tools, woodwork, iron-work, &c., &c., may be washed and thoroughly disinfected by employing a soapy solution of the fluid. One pound of soft soap is boiled in a gallon of water, and to every gallon of such a mixture two pounds of fluid carbolic acid is added, and the mixture is ready for use. It is of great importance to note that temperature has much to do with the decomposition of organic matter; therefore, when the solution recommended

* The Editor has to acknowledge his indebtedness to Messrs. Khroné & Siesmann, Whitechapel, for an instrument of the above kind, which in practice proves eminently useful.

for floors, &c., is to be used, it should be made by adding the water or soap solution at boiling-point. The former is poured at once over the floors, and in the latter, the various articles, as far as is practicable, should be immersed, and after cooling they may be washed and scrubbed.

The soap solution of carbolic acid answers excellently for cleaning the parts over which discharges from diseased parts are passing. The purulent secretions from the eyes and nose in contagious affections, saliva, &c., are constantly emitting the poison of the disease, and it should be the duty of an attendant to clear them away regularly. The soap solution may be diluted with an equal bulk of water for the purpose, and used with a soft rag or sponge. The celebrated Lincolnshire Sheep-dipping Preparation—manufactured by J. G. Dickinson, M.R.C.V.S. Boston—is an equally efficacious agent for these purposes.

Mr Dougall's Disinfecting Powder is probably the cheapest, simplest, and most effectual agent for the purification of buildings where cattle are kept. The cost is about ten shillings per cwt., and, as a fine powder, may be used by means of a common dredger, as directed for chloride of lime. Being a compound of lime, carbolic and sulphurous acids, its power of decomposing contagious matter is unequalled. The emanations of dung and urine are immediately arrested, and the manure is caused to retain a great per-centage of ammoniacal compounds, which, under the present careless system adopted in many buildings, are not only entirely lost, but allowed to execute inestimable damage upon the constitutions of the inmates. This compound should be used in every building whether disease is present or not: the end would be that when animals are healthy they would be preserved much longer in health; and where disease is present, its ravages would be considerably diminished and curative means greatly assisted.

The powder may be mixed with whitewash or water, and the former used to the walls, while the latter forms an admirable agent for throwing down drains, washing coarse articles, woodwork, &c. But why go into these details? If the stock-owner purchases the preparation, he will obtain ample directions and valid reasons for its constant use.

Lastly, we must not omit the preparations of Mr. Condy—commonly known as Condy's Fluid. The solutions of permanganate of potash are renowned as antiseptics and disinfectants, and purchasers will find in them everything that is required, either as solutions for purifying the air, as described at page 213, or for cleaning wounds and decomposing the contagious nature of discharges and excretions. Ample directions for use are given with the preparations, and they are readily procured from every druggist.

Legislation, in reference to cattle diseases, with the assistance of veterinary science, is calculated to do an incalculable good to the nation. At present the owner of live stock receives little or no assistance. In those districts where the greatest amount of Britain's wealth is accumulated, viz., the centres of agriculture, where the greatest amount of veterinary skill is constantly needed, there is positively the least. Quacks and pretenders are prevalent and all-powerful, and education and ability are unnoticed or absolutely spurned. In the United Kingdom there are not more than 1,500 qualified veterinary surgeons, but there are nearly 20,000 men who prey as parasites upon the sustenance of proprietors of animals under the name of farriers, cow-leeches—quacks, pretenders—and the dishonest assumption of the title of "veterinary surgeon." If there were no one to patronize ignorance, quackery, and chicanery, there would be none to practise it; the diseases of animals would receive greater attention, deaths would be

less, and the profits of the agriculturist from the breeding and rearing of stock infinitely greater.

Let the agriculturist ponder this question. Let him inquire how he is represented at head-quarters, and whether the question of contagious cattle diseases is likely to receive a continual share of attention from a special Veterinary Department of the Privy Council. These are matters affecting his vital interest ; and, unless he looks after them himself, his position will be constantly jeopardised, and plagues among animals more common than the indigenous diseases of our country.
—*Ed.*]

SECTION III.
GENERAL DISEASES.

GENERAL DISEASES.

DISEASES OF THE RESPIRATORY ORGANS.

SIMPLE CATARRH—COLD—CORYZA; *formerly known as*
FELON, EPIDEMIC COLD, OR INFLUENZA.

The observations most worthy of notice in this disease relate to its first cause. It in general proceeds from the sudden change of the atmosphere from a warm and moist air to a piercing cold and dry wind, which powerfully affects the whole animal frame, by shutting up the pores of the skin, and in a great measure putting a stop to perspiration. In cases of this kind the hide becomes thickened, and the hair looks pen-feathered or staring, and appears to stand the wrong way on the animal's back.

Cows are the most liable to be afflicted by the influenza, owing to the different state or changeableness of the weather, and also from their being more tenderly managed by being housed during the winter. The long-prevailing north and north-easterly winds at the spring of the year very often produce dangerous and sometimes fatal diseases.

Horned cattle, particularly cows, are subject to a great variety of diseases, which are for the most part brought on by the different effects of the elements on the animal frame, and often in a few days reduce them from the greatest state of perfection to a mere skeleton. In this case the regular course

of the blood through the veins and arteries is obstructed, which frequently causes an inflammation to take place in some particular part of the body, as the stomach, bowels or intestines, kidneys, bladder, and sometimes even the brain. In cases of this kind, bleeding should not be neglected.

Hence are produced fevers of different descriptions, which will be discussed under their proper heads in different parts of this treatise.

The first symptoms that are produced by taking cold are a heaviness in the head and dulness in motion, with weeping eyes, a sudden depression of the milky secretion; and if the hand be pressed upon the chine or any part of the back, the animal will instantly give way. This is for the most part called the *Chinc-Felon*, and is best understood by that name in the country. At other times the joints become more particularly affected than any other part, from which circumstance it is in general termed the *Joint-Felon*. Old cows are the most subject to this last complaint, especially a short time before calving. It is attended with considerable pain and weakness: if the animal lie down she is seldom able to rise without assistance, till after calving. This necessarily occasions much trouble to the owner, which, if proper care had been taken, might have been prevented. When this happens, they generally require some assistance at rising, until the time of calving; in all other respects they appear well, and eat their food as usual. For more information on this head, see "Rheumatism or Joint-Felon."

[Simple Coryza or Common Catarrh consists of inflammation of the lining membrane of the nostrils and sinuses of the head. By unmitigated exposure to the prevailing causes it may, and does frequently, extend to the eyes, throat, and air-passages.

Causes.—Sudden alternations of temperature, bad ventilation of buildings, cow-houses that have been newly built or whitewashed, and tenanted before being thoroughly dry, are

prolific causes ; deficient drainage, exposure in unsheltered situations, as in the hilly districts of the north and east coasts. Catarrh among cattle is common throughout the east of England and Scotland, but comparatively rare on the opposite coast. Sheep suffer particularly from long exposure to rain in fairs and markets, and particularly after being shorn. Like cattle, also, they suffer, much in the hilly and east coast districts. Pigs show the effects of the above causes to a remarkable extent, particularly when combined with deficient food. All animals in low condition are inordinately susceptible.

Symptoms.—The mucous membranes of the eyes and nose are at first dry and reddened, but in a few hours they become moist and discharge a thin watery secretion, which is eventually dense, opaque, and copious. The eyelids are tumefied, and increased heat is manifest in the bones of the forehead.



FIG. 64.—*Simple Catarrh.*

The animal sneezes, and not unfrequently there is cough. Febrile symptoms sometimes run high, and a repetition of such attacks terminates in pleuro-pneumonia of the sporadic form. A simple state of diarrhoea sometimes occurs. The progress of the disease is accurately betokened by the nature and rapidity by which the discharge is promoted. If it is

scanty and tardy, the fever is generally severe, consisting of difficult breathing, loss of appetite, suspension of rumination, rapid and hard pulse, constipation, deficient urine, &c., all of which are doubtless preceded by shivering-fits and a staring coat. If in a day or two the discharge increases, becomes purulent and copious, fever is diminished, and recovery speedily follows ; but if the system is still exposed to the causes that induced the disease, the terminations may be chronic nasal gleet, malignant catarrh, or sporadic pleuro-pneumonia.

Treatment.—If diarrhoea is present, administer at once the following :

RECIPE NO. 51.

Take of infusion of quassia.....	1 pt.
Tincture of opium	1 oz.
Aromatic spirits of ammonia.....	1 „

Mix.

When the bowels are constipated, a gentle laxative will be required. This may be composed of the subjoined ingredients.

RECIPE NO. 52.

Take of Epsom salts	12 to 16 oz.
Ginger and gentian, powdered, of each	1 „

Mix, and administer in one quart of warm ale.

The animal should be removed to comfortable quarters, or at least from all exposure to the influences that have caused the affection. The skin should be stimulated by smart friction and even clothing when necessary. The food should consist of bran-mashes, roots, and green food when they can be obtained ; and with such a diet daily doses of some neutral salt are of great service in reducing the fever.

RECIPE NO. 53.

Take of sulphate of potash	2 oz.
Water	$\frac{1}{2}$ pt. to 1 pt.

Mix, and administer morning and evening during the existence of fever. When the signs indicate a reduction of that

state, the dose may be gradually lessened, and finally discontinued on their disappearance.

In order to promote a free discharge of pus from the nostrils, several plans are adopted: First, a bag is placed over the nose, being suspended from the horns, at the bottom of which chaff, hay-seeds, sawdust, &c., has been put. An attendant should watch the animal, and from time to time pour boiling water through a hole by means of a kettle. (Fig. 65.) A small



FIG. 65.—*Method of Steaming the Nostrils to promote Discharge.*

quantity of turpentine or vinegar may also be added, which assists in promoting the discharges. Second, an India-rubber tube is attached to a proper steaming apparatus or, in its absence, a tea-kettle, as seen in the engraving (Fig. 66). Sufficient heat being applied, steam is generated, and conveyed by the tube to the nostrils. Third, boiling water is poured upon chaff, &c., in the manger or feeding-troughs, and the animal's head is held over it. The first and second plans are preferred, and should be continued several hours. When the steam-jet is used, care must be exercised in order to avoid having too great force, by which the parts will suffer from being scalded.

In some cases great depression succeeds the first part of the

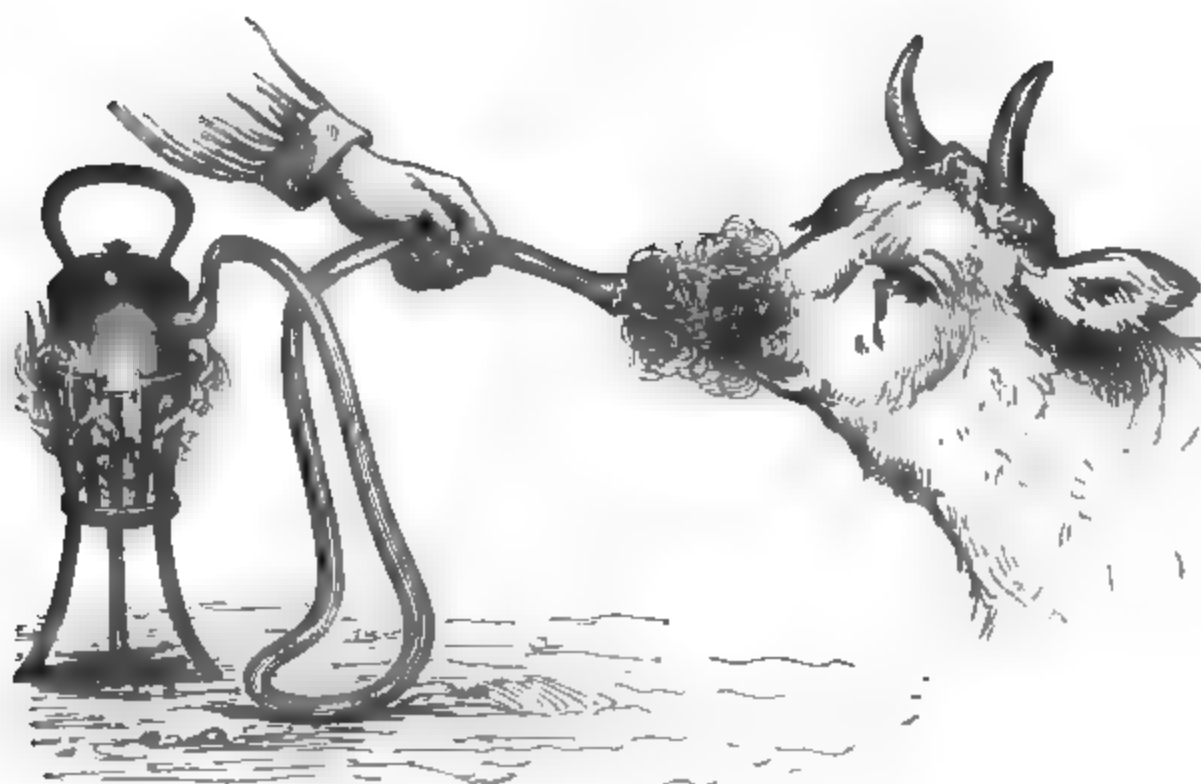


FIG. 66.—*Application of Steam to the Nostrils.*

attack, particularly if diarrhoea is present. Stimulants are then called for, and the heart's action, which is weak and rapid, should be controlled by calmatives, as belladonna.

RECIPE NO. 54.

Take of aromatic spirits of ammonia	2 oz.
Extract of belladonna	$\frac{1}{2}$ dram.

Rub the belladonna down with water in a mortar until it forms a thick emulsion, then add to the ammonia. Mix with a pint of cold ale or porter, and administer two or three times a day.

Among sheep the following forms a good fever drink.

RECIPE NO. 55.

Take of solution of the acetate of ammonia	1 oz.
Extract of belladonna	1 scruple.
Water	6 oz.

Make an emulsion with the water and extract of belladonna,

then add the acetate of ammonia. This draught should only be mixed when required.

Pigs may receive in their food :

RECIPE NO. 56.

Take of black antimony	1 part.
Nitre (saltpetre)	1 „
Sulphur	1 „

The whole should be separately powdered and mixed, and kept in a well-corked bottle, a tea-spoonful being a suitable dose for pigs of eight or ten stones weight,* given once or twice a day. If the appetite is absent, give the fever-draught as prescribed for sheep. Stimulants, as the aromatic spirits of ammonia, one or two drams, spirits of sweet nitre, sulphuric ether, and in similar doses, may be given in ale or porter, &c., when the vital powers are prostrate.—*Ed.*]

SORE THROAT — LARYNGO-PHARYNGITIS — LARYNGITIS—
ANGINA, &c.

[Sore throat is common among cattle, sheep, and pigs. The *causes* are those of catarrh generally, and it may exist independently of or in connection with simple catarrh.

Symptoms. — As an independent affection, sore throat is characterized by the following signs: If the animal is closely watched, at the outset there will be observed a difficulty in swallowing, accompanied by a hard or tickling cough. These gradually acquire intensity, and soon the process of eating and swallowing becomes painful. The appetite is absent, but there is thirst, an inability to swallow, and a copious flow of saliva when the jaws are separated. Pressure on the windpipe in the region of the throat gives great pain. The parts are swollen, and the membranes internally are intensely red. The pulse is

* Rate of 14 lb.

FIG. 67.—*Laryngitis or Sore Throat.*

hard, full, and rapid, and breathing accelerated, and sometimes much constitutional disturbance exists. In two or three days the cough is less frequent and hard—it has become soft, and causes less pain; the pulse has also become softer, and approaches the normal standard; a discharge takes place, which is ejected by coughing; the appetite returns, and the animal is convalescent in about a week or ten days. Unfavourable cases, which are more common, terminate in bronchitis or sporadic pleuro-pneumonia. Among cattle, sore throat seldom continues long as an independent affection, and is more generally associated with, or speedily followed by, one or more of the diseases named.

Treatment.—Move the bowels by frequent enemas, but do not attempt the administration of medicines by the mouth, or the animal may be choked in the fruitless attempts to swallow. Let a mixture of the following ingredients be made up and administered frequently during the day:

RECIPE NO. 57.

Take of muriate of ammonia	2 oz.
Camphor	1 "
Gum kino.....	1 "

Each of the ingredients are to be reduced separately to a fine powder, and carefully mixed. A sufficient quantity of treacle—about 1 lb.—is then added to make a stiff mass, of which a table-spoonful is to be placed on the tongue twice or thrice a day.

Small doses of nitre, the sulphate or chlorate of potash, may be dissolved in the water, but care is required in their use, and the directions of a veterinary surgeon in attendance in reference to them should be scrupulously attended to.

Sheep may receive a tea-spoonful of the mixture during the same times ; and pigs should have, by administration if they cannot drink, a daily dose of the subjoined mixture :

RECIPE NO. 58.

Take of tartar emetic	3 grs.
Saltpetre.....	2 drs.

Make three powders, and administer each in a little thick gruel.

An embrocation of mustard, flour, and water may be applied to the throat of sheep and pigs, the wool being first removed in the former. But to cattle, the embrocation given at page 240 will be more serviceable.—*Ed.*]

CROUP.

[This affection is somewhat rare among the lower animals, and it has been observed in the cow with greater frequency than in others.

Nature.—An intense and violent inflammation of the larynx principally, which is attended by an acute spasm or contraction of the muscles of that organ, and, in some cases, also by an exudation of fibrine upon the lining mucous membrane, constituting what are known as “false membranes.”

Symptoms.—A hard, full, and rapid pulse, the beats amount-

ing to 90 or 100 per minute. Symptomatic fever is severe and extensive, and breathing is quickened and laboured. Shortly these become more urgent, and a loud croaking or crowing sound is emitted, principally during an inspiration ; a convulsive cough is present, which is speedily excited by external pressure, and violent as well as irregular paroxysms may also be looked for. Croup is a disease that may appear under an acute and sub-acute form, from which the progress will differ materially in several cases. Much of this depends upon the previous condition of the animal and his treatment. In the acute form, the last stages are rapidly reached, expectoration occurs freely at the end of three or four days, and discharge of false membranes is frequently attendant upon that state. Croup is sometimes combined with bronchitis and inflammation of the lungs, when the signs and attendant fever suffer some modification. In a case recently brought under the notice of the writer, membranous casts of the larynx were ejected, and after some time, when the patient was supposed to be convalescent, the bronchial tubes of one side furnished a counterpart of their form and ramifications. In the sub-acute form the prostration of strength is great, the visible mucous membranes are purple in colour, a state of blood-poisoning ensues, and the animal dies of malignant and putrid disease. In the acute form death occurs from rapid suffocation—*asphyxia*.

Causes.—Those of simple catarrh modified by some peculiarity of system, as well as that probably of the causes themselves.

Treatment.—Bleeding may require to be resorted to in the early stages of the acute type, and active blisters to the throat. The operation of tracheotomy also may be imperatively called for, as described at page 88, and fever medicines must be regularly administered. In the sub-acute form the treatment as advised under “Malignant Sore Throat” may be followed.

The disease is very fatal, and proprietors should seek the best aid under the circumstances. Rash and imperfect measures will only frustrate the attempts at recovery, and therefore all treatment should be based upon conditions that are present, and these are best distinguished by a properly educated practitioner. The insufflation of different medicaments in fine powder are sometimes resorted to, or they are blown through the artificial opening. Of these, calomel, burnt alum, iodide of potassium, &c., and solutions of nitrate of silver to the fauces, have been tried.—*Ed.*

BRONCHITIS.

[Among the domestic animals, bronchitis appears as a much more frequent disorder than is generally estimated. In all exposed situations, and among all animals insufficiently housed, or subjected to alternations of temperature, and particularly to cold and wet, bronchitis has a special existence and preference. It occasionally exists as an enzoötic disease among the grazing herds of a particular locality, and not unfrequently results as a sequel of sore throat. Bronchitis very much resembles pleuro-pneumonia, and is, therefore, at times confounded with it. Both, however, are in many cases combined. Like catarrh and sore throat, bronchitis is prevalent chiefly in the spring and autumn months, when the temperature is very variable and cold rains prevail.

Symptoms.—Thirst generally is present, and the animal dull; the pulse is frequent, full, and tolerably hard; mouth and nostrils hot; horns, ears, and extremities warmer than natural; breathing also frequent, and a short, troublesome cough invariably distresses the patient; the appetite is absent, rumination suspended, and more or less difficulty in swallowing decides that laryngitis is also present. Visible mucous membranes are red, bowels constipated, and urine deficient. In

some instances diarrhoea is decided from the first, when the horns, ears, and extremities are cold, the coat stares, and occasional shivering-fits occur. In a few hours these signs suffer change: the pulse becomes more frequent and small, prostration of strength is evident, the legs and ears become cold, and breathing is greatly impeded, particularly if the lungs participate in the inflammatory action.

In making a correct diagnosis of the case, the lungs and their receiving tubes—the bronchiæ—should be carefully examined, and the number of respirations accurately noted, in conjunction with the character of the pulse, temperature, &c. The former will be found to range as high as 30, 40, or even 50 per minute, the pulse numbering 70 to 80, with greatest degrees of fulness and hardness at the first numeration; and the temperature, as indicated by the thermometer in the rectum, 104° or 105° F. The respirations are not in relation towards each other. Each *expiration* is accomplished with moderate ease, but the *inspiration*, by which the lungs are inflated, requiring muscular effort, is surmounted with difficulty. In the early stages of the disorder, the muscular fibres of the bronchial tubes are rigid, the membrane lining them is dry from existing congestion, and the cough is then hard, short, and frequent. A separation and recognition of the sounds heard are of great value to the veterinary practitioner. In the expiration, no sound is audible from the causes just named; but the inspiration, during which air is drawn through contracted tubes, with rough lining membranes, gives rise to a much louder sound, known as a roar or "*rhonchus*." The lungs are found to be pervious, or, in other words, fulfilling their duties, the sounds of disorder being confined to the vicinity of the bottom of the windpipe and base of the lungs, where the bronchial tubes are numerous and close together, as well as of sufficient size.

In the second stage of bronchitis—which is reached about

the second or third day—a watery secretion is expelled in coughing, an act which, as yet, has suffered no mitigation, but is rather more frequent. Inflammation may be now said to be present in all its activity, and the watery secretion assumes a viscid character from an admixture of mucous. Pus is also secreted, and the discharge gradually acquires consistence and colour, until it becomes white, opaque, and dense; while the cough is less frequent and softer, expelling the secretion at each act. About the fourth or fifth day we may expect the crisis of the disease to be reached. Favourable signs are gradual, reduction of temperature taking place prior to the soft and easier cough, and continuing to suffer no augmentation, except that which may be ascribed to the natural diurnal variation. The pulse becomes fuller, softer, and less rapid. Expectoration or discharge of the purulent fluid from the bronchial tubes is effected by a vigorous cough, the appetite returns, secretions and excretions become natural, and the animal is convalescent by the tenth day or thereabouts.

Unfavourable terminations are predicated by variable temperature and sudden fall after high readings to the extent of six or eight degrees of Fahrenheit's thermometer; pulse small, more frequent, and finally imperceptible, and death on the third or fourth day.

The rapid wasting of the flesh in all animals affected with disease of the respiratory organs is remarkable, and forms, with the persistent and painful cough of the first stages, a valuable sign and aid to correct conclusions. These organs possessing such important offices as the aëration of the blood in health, a suspension of their functions is always attended with loss to the system, and waste occurs as a result of the animal feeding upon itself.

There is yet one condition which requires notice, as having a valuable acceptance as a most unfavourable sign. At the stage of bronchitis when expectoration freely ensues, portions

of purulent discharge are likely to find their way during forcible inspirations to the recesses of the smaller tubes; the result is silence in that part, or absence of the usual respiratory murmur. Percussion, however, discloses that no consolidation has taken place; the sounds are hollow and resonant, not dull and heavy. Temperature exhibits no variation to cause fear; the pulse is gradually assuming healthy characters, and with time a full expectoration ensues, and the parts again exhibit

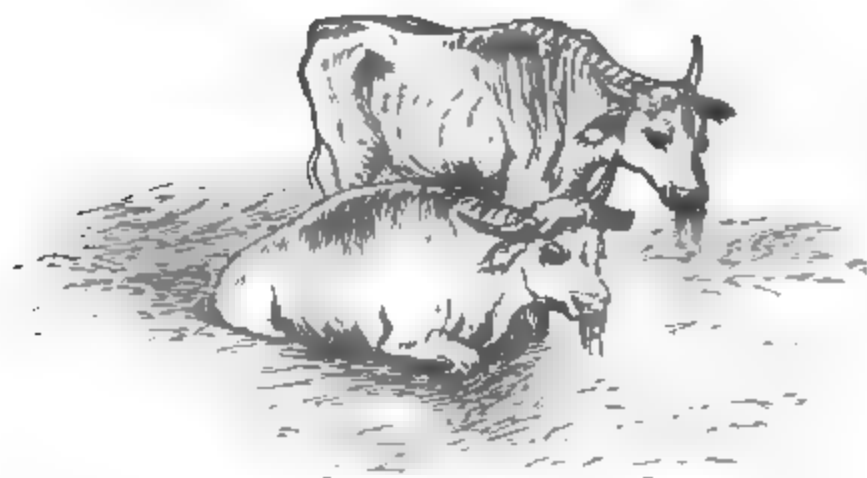


FIG. 68.—*Animals affected with bronchitis.*

the usual respiratory murmur. In unfavourable cases, the lungs at these parts suffer collapse, the tissue around the air-cells acquires density and toughness, and the organ ultimately is caused to sink when placed in water. Air can no longer be admitted to the parts, their functions are lost, and animals recovering with such conditions are "short-winded:" they breathe rapidly, and frequently are disinclined to fatten properly afterwards.

Bronchitis may terminate in pneumonia, pleurisy, hydrothorax, hepatization, &c. The duration of the disease varies from three to five days, or even weeks, but in the majority of instances the former is the closest approximation to the usual condition of affairs.

The symptoms in sheep and pigs do not differ greatly: like

cattle, they frequently lie much, or stand with legs wide apart, breathing rapidly and coughing violently. The pig generally isolates himself, and is found covered with straw, to court warmth and quietude.

Treatment.—When bleeding is preferred, it must be effected in cattle during the fulness and hardness of the pulse ; death follows all attempts after that stage has passed. Aconite is a valuable remedy when cautiously administered, but is generally unsafe, except in the hands of a practitioner versed in its action, and who can properly estimate how far its administration can be persevered with. It may be given in the subjoined form and combination :

RECIPE NO. 59.

Take of solution of acetate of ammonia	4 oz.
Fleming's tincture of aconite	30 drops.
Water	$\frac{1}{2}$ pt.

Mix, and give immediately.

At the end of four hours the draught is repeated, having the dose of aconite reduced to twenty drops, and at the lapse of each succeeding period of four hours ten drops are to be given, with the same quantity of ammonia as prescribed. The aconite must be withdrawn as soon as the pulse is reduced and symptoms denote greater quiescence, and half a dram of the extract of belladonna substituted ; the draught being administered *twice* a day only. At this stage, but not a moment sooner, the lower part of the neck, breast, and sides behind the elbows may be dressed with the mustard embrocation. (See Appendix.) Active blisters during the existence of acute disease of important organs are among the most baneful and effective destructive agents that man can devise, yet some lecturers on veterinary pathology recommend their hearers to adopt the rule in their practice. This may arise from the too common method of making teachers out of inexperienced young men, where mistaken economy is studied before effi-

ciency and prospective good. Farmers and others meditating a study of veterinary medicine for their sons should select the well-established schools, where every appliance and opportunity exists for gaining experience. In some institutions the commercial principles are alone studied, and dogmatical opinions have preference to the truths of sound philosophical reasoning; hence such advice as already quoted, which but forms a tithe of the mass of error advanced under assumption and effrontery.

If the cough proves troublesome, the addition to the draught already given of one or two drams of the powdered ipecacuanha, or an ounce of the oxymell squills, will be found to possess powerful effects in reducing the irritation. On the appearance of a copious expectoration of purulent discharges, reduction of the cough, pulse, and temperature, the following draught may be given morning and evening:

RECIPE No. 60.

Take of solution of the acetate of ammonia	2 oz.
Aromatic spirits of ammonia.....	$\frac{1}{4}$ „
Or spirits of nitric ether.....	2 „
Infusion of columbo, quassia, or gentian	2 „
Tepid water	1 pt.

This being continued three or four days, and the appetite restored, half a dram of the tincture of perchloride of iron may be mixed with half a pint of water and incorporated with a feed of oats, with oat or barley-meal or bran, morning and evening, for six days, when the animal may be gradually brought to his accustomed food and habits.

For the sake of simplicity, it may be stated, the medicines already given may be administered to calves, sheep, and pigs, when the doses are reduced to one-fourth, one-sixth, or one-eighth, as occasion requires.—*Ed.*]

PERIPNEUMONY (PNEUMONIA) OR INFLAMMATION (OF
THE SUBSTANCE) OF THE LUNGS.

[Pneumonia is common to the ox, sheep, and pig in certain localities, having the common causes as given under laryngitis, bronchitis, &c. It prevails more commonly and has greater tendencies to relapse than the latter disease.

Symptoms.—The affected animal is found to be dull and stiff, with a staring coat, and probably undergoing a shivering-fit of greater or less violence. The skin next becomes dry, harsh, as well as hot and tight on the body; the visible mucous membranes are red, and a suppressed cough is present. The mouth is hot and clammy, catarrhal signs are frequently present, countenance anxious, head protruded, breathing short and accelerated, numbering 30 or 40 per minute; while the labour appears to be chiefly performed by the abdominal muscles, and the ribs and chest generally are caused to perform as little motion as possible. The pulse at the outset is frequent, numbering 60 or 70 beats per minute, besides being full and oppressed. The bowels are constipated, urine deficient and highly coloured; motion is objectionable and produces distress, and a great disposition to lie quiet is evident in cattle as well as the sheep and pig.

The aspect of affairs is to be more accurately discovered by auscultation, or placing the ear upon different parts over the outside of the chest. Sometimes only one lung is affected, when it furnishes no respiratory murmur; but that of the opposite side, being compelled to do the office of both, affords a murmur of increased force. If both organs are seized, the absence of respiratory sounds is more evident towards the upper part or base, while the lower portions furnish sounds stronger than natural. The changes that occur and signs produced are almost identical with those described at some

length under "Epizootic Pleuro-pneumonia" at page 145, and will greatly apply here. In consequence of effusion within the substance of the lungs, the characteristic consolidation appears, when there is not only loss of the usual murmur, but the ribs of the side are fixed, and sounds emitted on tapping them with the fingers are dull and heavy, while signs of suffocation are not uncommon.

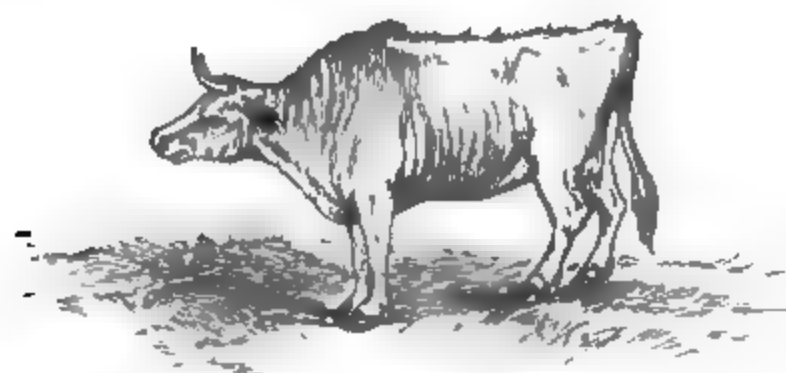


FIG. 69.

The expired air is hotter than in health, and as the lungs are overtaken by disease, the signs acquire severity and great urgency. The full pulse becomes rapid, small, and feeble; breathing more laboured, shorter, and accompanied by foetor; the extremities are cold, the cough is occasional and weak, and small quantities of blood are sometimes thrown up in the act. The animal now stands propping persistently (Fig. 69), with neck and nose outstretched. If the head is raised, there is great tendency to fall backwards (Fig. 70); gradual prostration and wasting ensues, and at length the animal drops head foremost—first falling upon the chest (Fig. 71) with legs doubled beneath, and next upon the side, where she remains, occasionally lifting the head and vainly attempting to rise under great distress, until death terminates the sufferings. Pneumonia may also terminate in resolution, or abscess and gangrene.

Resolution or gradual recovery is denoted by gradual decline of all symptoms, and the animal is convalescent in about



FIG. 70.—*Sporadic Pneumonia.*

fifteen days, but death usually takes place in unfavourable cases from the fifth to the twelfth or fifteenth day. In those delayed to the latter period, consolidation or gangrene may be expected.



FIG. 71.—*Last Stage of Sporadic Pneumonia.*

Post mortem Appearances.—The affected lung or portions are involved in a condition termed consolidation, as a result of exudation within the interlobular tissue, and the appearances presented are similar to those exhibited in Plate III. More generally, however, in simple pneumonia the portions of diseased structure are separate and surrounded by spaces that are undergoing transition from health to disease. In the contagious form the whole organ is either affected or the transitional spaces are absent or imperfectly marked. In other

cases portions of the lung are gangrenous, the process of inflammation has deprived them of essential nutrition; a mass therefore dies, becomes a very dark green or bluish-black colour, and sometimes is nearly detached.

Simple or sporadic pneumonia is sometimes confounded with the epizootic or contagious affection, when the history and symptoms are not sufficiently noted. Further remarks on this head will be found under the subject "Sporadic Pleuro-Pneumonia."

Treatment.—A saline laxative may be given during constipation, as—

RECIPE NO. 61.

Take of Epsom salts 8 to 12 oz.
Ginger and gentian, powdered, of each 1 „

Mix, and administer in gruel.

If the pulse is full and hard, bleeding may be resorted to, or the aconite draught as prescribed for bronchitis. Injections of warm water are valuable in assisting the action of the bowels, and should be repeated. (See Appendix.) Sheep and pigs may receive similar treatment, but in the latter, cutting the ears and tail should not be relied upon. (See chapter on "Blood-letting," page 39.)

Cool air is indispensable, while the body should be clothed, and the skin and legs excited by friction, so as to produce an equalization of heat as early as possible. As soon as the acute signs have been allayed by the treatment already advised, each side of the chest and front of the breast should be dressed with a strong blister—forms of which are given at page 34, article "Counter-irritants." The following is most active:

RECIPE NO. 62.

Take of croton oil 1 part.
Sulphuric ether 10 „
Spirits of wine..... 10 „

Mix, and agitate. Sufficient is rubbed into the sides, &c.,

with speed and friction. An immediate effect is observed, and after sufficient swelling has been induced, the preparation may be washed off. In the remaining stages treatment must be followed as directed under "Bronchitis."—*Ed.*]

ABSCESS OF THE LUNGS.

[Cattle and sheep apparently recovering from bronchitis, pneumonia, or pleuro-pneumonia of the common, simple, or sporadic kinds, may suffer from the formation of abscesses within the structure of the lungs. A portion of the organ under the effects of effusion is unable to take on the process of recovery. All around becomes clear and healthy, foreign matters being absorbed; but the central part is circumscribed, pus forms, and, by the process of ulceration, finds its way into a second abscess or bronchial tube. Still more rarely it discharges through the lung outwards, and is collected at the bottom of the chest (empyema). The presence of an abscess

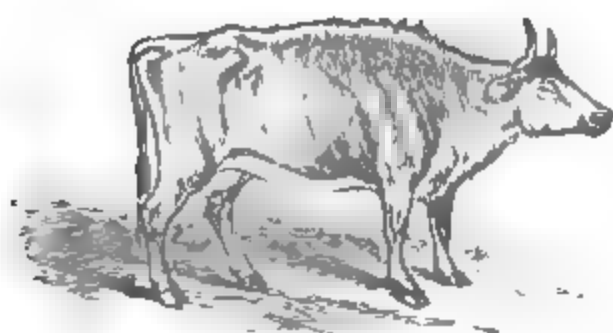


FIG. 72.—*Abscess in Lungs.*

is known by continual wasting of the body, a state of anæmia, small, frequent and feeble pulse, foetid breath, constant, moist, rattling, feeble cough, and discharge of offensive pus and even portions of the lung. The appetite is capricious, and a sound called the "cavernous *râle*," caused by the air passing in and out of the abscess during respiration, is heard when the

ear is placed over the ribs near the spot. Such animals linger long, and present most pitiable sights. At length they are found dead, hectic fever having been established previously.

Treatment is frequently tedious and not always successful. The animal requires fresh air and opportunities for gentle exercise, and good food—as prepared peas, barley, oats, linseed cake, roots, green food, &c., alternating with each other. Strong beef-tea, and even cod-liver oil, is very useful to the sheep and pig. Linseed oil has been used with benefit. Stimulants and tonics, as prescribed for bronchitis, are specially called for—particularly the preparations of iron. Active blisters are also attended with marked improvement in severe cases.—*Ed.*]

PLEURISY—HYDROTHORAX—WATER IN THE CHEST.

[By the term pleurisy we understand the process of inflammation going on in the serous membrane termed the “pleura” or covering of the lungs and heart, as well as lining of the whole chest. Pleurisy is observed sometimes as an independent affection, and is apt to recur as a result of rheumatic tendency when the heart and its appendages suffer extensively. More generally, however, and apart from rheumatism, it is complicated with pneumonia.

The *Causes* are identical with those producing other diseases of the respiratory organs—animals in exposed districts suffering mainly. The prevalence of such wide-spread causes frequently gives rise to the disease over whole tracts of country at the same time, attacking animals of all ages, and from this fact it has been erroneously viewed as an epizootic or contagious disease. Animals that are milking heavily and turned from warm houses, others that are poor and in delicate health, sheep shorn of their wool during cold rainy weather, &c., are liable to pleurisy. Injuries to the chest will produce it. The affec-

tion is present upon both sides at once in many cases, but in others one only will be seized.

Symptoms.—Fever of a sympathetic kind is present at the outset. The pulse is observed to be smaller than natural, as well as being firm and wiry, the beats being from 50 to 60 per minute. The animal breathes from the abdomen, as it were, the chest being fixed and elbows turned outwards, inspirations short and imperfect, while the expirations are prolonged and more easily affected. The head is low, ears drooping, countenance anxious, eyes half closed. Pressure with the thumb between the ribs gives great pain, and causes the animal to

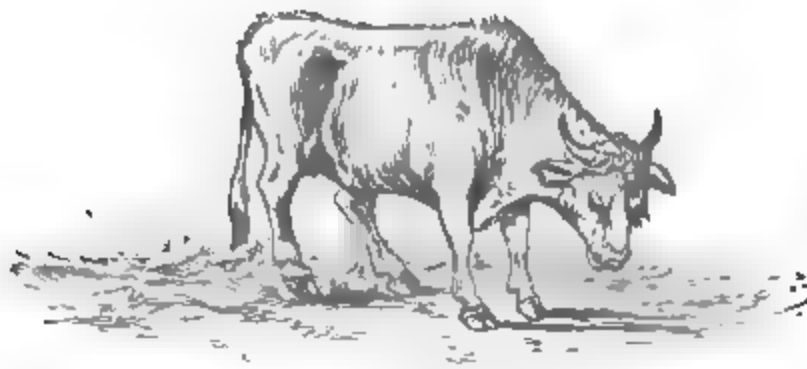


FIG. 73.—*Acute Pleurisy.*

grunt; the flanks are hollow and tucked up; a hacking cough is present, which gives rise to suffering, and is avoided as much as possible by the patient. The appetite and rumination are suspended; nose dry, and generally devoid of discharges, as in pneumonia; mucous membranes exhibit less colour, and the expired air is not so hot. Frequently signs of rheumatism occur in conjunction with pleurisy, shifting from joint to joint, and there is great pain present from the first. When the ribs are struck in percussion, the sounds elicited are resonant and clear; but when the ear is applied, the surfaces of the lungs and ribs, which glide over each other smoothly in health, now give rise to a grating (friction) sound, while the lungs them-

selves furnish the usual respiratory murmur. Pleurisy terminates in resolution or effusion—hydrothorax.

Resolution.—This is the state in which all the signs of disturbance gradually disappear after the fourth or fifth day. The twitching of the muscles and abdominal action ceases, the animal is disposed to move about more, and lie down without grunting; the pulse becomes soft, fuller, and less frequent; temperature gradually falls from day to day to the normal standard; the appetite returns, and convalescence is established about the fifteenth day.

Hydrothorax.—With the gradual accumulation of fluid within the chest, the urgency of all acute signs usually subsides. Respiration is deeper and prolonged, the abdomen drops, the legs become fine, less pain is experienced, and general liveliness is manifest; the pulse becomes soft and more distinct, but continues frequent, with variable periods of infrequency. After a few hours the breathing is laboured, muscular twitchings recur, and a peculiar flapping of the nostrils takes place; the legs, chest, and abdomen become swollen from the accumulation of serum beneath the skin; the inspiration is irregular and prolonged, while the expiration is obstructed, and discharged only by more than ordinary efforts. When the ear is placed upon the sides, the respiratory murmur cannot be detected in the lower regions. If the ribs are struck, dulness is evident as high as the fluid extends. The animal now stands with legs apart and extended head—low and protruded—and neck straight, ears drooping, flapping nostrils, anxious countenance, eyes staring, and respiration heaving from impending suffocation. The pulse becomes irregular or fluttering and imperceptible; the legs, nose, and ears are cold as clay; a rattling sound is heard in the windpipe during respiration; weakness is apparent, and the animal totters. If the head is raised suddenly, he falls backwards from fainting; when allowed to stand without interference, falls head foremost in an awk-

ward manner, and, after a few abortive struggles, dies. (See Figs. 70 and 71.)

Post mortem Appearances.—The most characteristic evidence of death arising from pleurisy is the quantity of serum found in the chest, amounting in oxen sometimes to the extent of four or even five gallons in cases of not more than forty-eight or fifty-six hours' standing. The lungs are congested, and in some instances consolidation has begun; the air-cells are collapsed, the interlobular tissue becomes firm and tough, of a dull colour, flabby, and heavier than water; the cut surface is dry and smooth, and exhibits the septæ of the interlobular substance in a well-defined manner. Such conditions result from pressure of the effused fluid, as well as a loss of respiratory power, and admit of expansion under artificial inflation.

Treatment.—Blood-letting has not proved serviceable in this affection. Greater reliance should be placed on the exhibition of laxatives, injections, and aconite, as prescribed for bronchitis, or the following:

RECIPE NO. 63.

Take of saltpetre	4 drs.
Camphor (finely powdered)	2 „
Nitric ether.....	1 or 2 oz.

Dissolve the camphor in the ether, and add one pint of water or gruel. The camphor will be at once precipitated in very fine division, in which state the effects will be more rapid, and less liable to cause irritation of the digestive organs. The saltpetre may afterwards be added, and the whole well incorporated before administration. This dose should be given every six hours to an ox or cow. Calves, sheep, and pigs receive proportionate doses, one-fourth or one-sixth, according to size. Mustard poultices (see Appendix) or blisters, as already advised (Recipes 7, 8, 9, 10, 63), are indispensable on the remission of the acute signs. When effusion is certain, the system will require support in the shape of stimulants,

which, when judiciously administered, may effect a cure. Powdered digitalis has been extolled as a remedy. It may be administered with the following combinations :

RECIPE NO. 64.

Take of powdered digitalis	1 dr.
Saltpetre	2 to 4 dr.
Nitric ether	1 oz.

Mix, and administer three times a day to large oxen, in a pint of ale or porter.

Cantharides, iodide of potassium, turpentine, &c., are also serviceable when alternated with the digitalis, or given instead of it. Much good may be done in thirty-six hours by such a mode of treatment, and as soon as the absorbent action, with free evacuation by the kidneys, are established, the following may be given twice daily:

RECIPE NO. 65.

Take of sulphate of iron	2 dr.
Common alum	3 "
Infusion of quassia	$\frac{1}{2}$ pt.

Mix.

Some practitioners perform the operation known technically as *Paracentesis thoracis*, or simply tapping the chest to draw



FIG. 74.—*Method of drawing the Skin into folds prior to making the primary incision.*

off the accumulation of fluid within. The method adopted is as follows : The skin over the ribs is taken up by the fingers of the left hand and drawn aside, as in the figure ; the space

between the eighth and ninth ribs is then selected, and a small incision is made by plunging the lancet through, nearest to the ninth rib. A small trocar and canula, as seen in the engraving, is then pushed carefully through the muscle; and immediately it has entered, the outer case or canula is pushed inwards, and the stilette withdrawn, when the fluid flows freely. A probe or piece of wire must be in readiness to remove obstruct-



FIG. 75.—*The Trocar and its outer case, the Canula.*



FIG. 76.—*The Fluid flowing from the Chest by means of the Canula.*

ing plugs of lymph, &c., that sometimes insinuate themselves in the opening. Stimulants, as the ethers, ammonia, &c., and tonics, as sulphate of iron, gentian, &c., with a generous diet after tapping, and otherwise great care are required.—*Ed.*]

SPORADIC PLEURO-PNEUMONIA.

[Special allusion to the occurrence of pleuro-pneumonia apart from the contagious form already discussed has rarely been made by writers on subjects connected with veterinary science.

Non-professional persons, unacquainted with the nature and operations of disease, have accepted without alternative the positive error promulgated in descriptions that have embraced several affections as one, recognizing no line of separation between them. Simple or sporadic pleuro-pneumonia has been known since the time cattle and sheep first became in Britain a source of national wealth; but description and want of scientific knowledge failed to recognize the complications with which it is frequently associated. When the epizootic form of 1842 reached these shores no difference was observed, and the writer possesses evidence that the veterinary lectures of the period, and those delivered even within a few years ago, also taught the same. The belief was that an augmentation or aggravation in the signs and prevalence of the sporadic malady, from an inexplicable cause, had taken place. The time had not arrived when contagion could be admitted, nor veterinary science become special. Mortality beginning to be more frequent, greater attention was paid to the diseases of stock; foreign literature was ransacked, and it was discovered that a special form of pleuro-pneumonia had come amongst us, as a result of free importation of cattle, and was being continually brought. Investigations followed each other closely, and special kinds and differences were observed, although these at first sight appeared to belong to identical affections.

Reaction followed these observations. The belief that a contagious form had been brought was met by stout denial, and the signs and evidences of simple pneumonia were adduced as proofs that the disease had been with us from time remote. Any other conclusion could scarcely have been looked for when are considered the imperfect observations and teaching that had been pursued, and none other would be possible in the short experience we then had of epizootic diseases among cattle and sheep. Out of the vicissitudes of the past, how-

ever, warning and important information has been derived. We are, therefore, enabled to speak confidently upon these matters, and point out the great necessity which calls for a clear and distinct enumeration of the signs by which the maladies of live stock can be separated and identified.

For the sake of clearness, we have placed the affections side by side in contrast, their points of identification being in the order as they generally occur to the scientific observer.

SPORADIC PLEURO-PNEUMONIA.

Common to man and *all* animals.

Sudden and acute in its attack and progress.

Has no incubative or latent stage.

First signs visible in a few hours from the operation of known causes.

Greatly influenced and even induced by climate, temperature, exposure, ill ventilation, bad drainage, bad management, &c.

Removal of these is attended with a reduction of disease and mortality.

Affects the same animal more than once in a lifetime.

Seldom more than one, two, or three out of a number are affected; the rest suffer from other catarrhal affections.

The attacks are simultaneous.

Is entirely suppressed by mitigation of causes.

Is markedly amenable to medical treatment.

Not usually fatal.

EPIZOÖTIC PLEURO-PNEUMONIA.

Hitherto confined to bovine animals—cattle.

Insidious in its attacks and tardy in progress.

Has an incubative stage of forty-two days generally.

First signs not visible until the termination of the period of incubation, viz., forty-two days generally.

None of these produce epizoötic pleuro-pneumonia: by debilitating the system, they may cause its progress to be modified, but in no case to hasten its attack.

The same effects no reduction of either disease or mortality.

Never affects the same animal twice in a lifetime.

Frequently more than two or three are seized — generally the whole at variable periods.

The attacks are in succession.

No effect occurs here from the adoption of the same, but continues to prevail for weeks and even months.

Is affected by no kind of treatment.

Generally fatal, even to the extent of fifty per cent. and upwards.

SPORADIC PLEURO-PNEUMONIA.

Prevails in localities according to season, and is found in districts where cattle are bred and no other allowed to enter.

Not propagated by contagion.

Not produced by the diseased products of the body, as saliva, excrement, urine, &c.; nor conveyed to other animals occupying the place of those dying or diseased.

Is unaffected by movement to and from fairs and markets, as far as propagation is concerned.

Not confined to large herds or dairies of cattle.

Terminates in about a week or ten days.

Animal regains its former health in most cases.

Portions of the lungs are usually capable of resolution.

Hydrothorax not common.

Death in four to eight days.

EPIZOÖTIC PLEURO-PNEUMONIA.

Confined to none where cattle are conveyed, and prevails without respect to season; where cattle are bred and none are taken it is never witnessed.

Is propagated by contagion.

Cattle occupying the stalls or stables where animals diseased or dying have been standing become affected with the disease. The conveyance of fodder, portions of excrement, or diseased products usually generate the disease in others, and an animal allowed to smell at one diseased becomes affected.

Is greatly augmented by cattle traffic.

Always prevails most in the dairies of towns and those proprietors who use the markets.

Progress lingering, frequently extending over some weeks.

After recovery the animal is frequently worthless.

One or both lungs are generally destroyed or unable to take on the process of resolution.

Hydrothorax very common.

Death frequently delayed to the fifteenth day.

This enumeration may appear somewhat extensive; it is nevertheless called for in the veterinary and agricultural interest. The scientific practitioner will, however, not be content with it, but add numerous other distinctions of a pathological nature, which are now recognized as incontrovertibly belonging to each form.

The *Symptoms* common to simple or sporadic pleuro-pneumonia are as follow: A shivering-fit may be observed, and

shortly afterwards the secretion of milk is arrested. Acute symptoms now quickly succeed, consisting of rapid pulse, which is firmer, harder, and not so full as the pulse of simple pneumonia. As the name implies, this disease partakes of pleurisy and pneumonia; we therefore observe at first a loud murmur through the lungs, quickly succeeded by a crepitus or crackling sound, which rapidly disappears as the lungs are invaded. The friction sound of pleurisy also is heard, and percussion gives a dull tone in the affected parts; pressure in the intercostal spaces, or on the spine, gives pain. The bowels

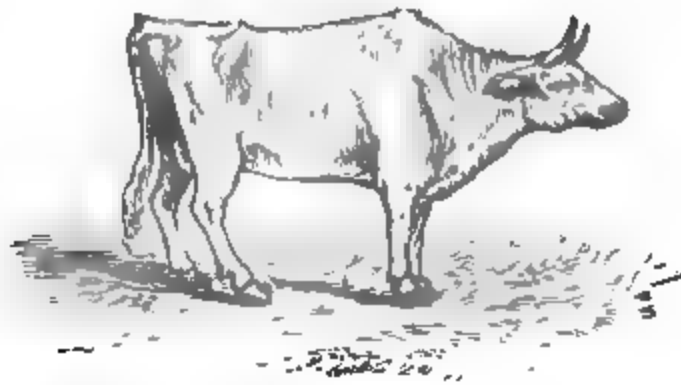


FIG. 77.

are constipated, urine deficient and highly coloured; catarrhal signs, as discharge from the nose and eyes, are present. Membranes injected; legs, horns, and ears cold; coat stares, and skin becomes harsh and dry. The animal in many cases never entirely loses the appetite, nor is rumination suspended, and the signs enumerated gradually disappear, the pulse acquires fulness and becomes softer, breathing is regular, secretions natural, general warmth is established, and the animal becomes convalescent before the extensive wasting occurs that characterizes epizootic pleuro-pneumonia. Throughout there is not observed that soreness of the windpipe (tracheitis) and dilatation, and flapping of the nostrils, as in the contagious form; and, lastly, these signs usually are absent about the tenth day.

Treatment.—Under this head the reader must consult the measures directed for pneumonia and pleurisy. They are applicable here—particularly the aconite treatment. The successive stages require diuretics, stimulants, and tonics, and the use of blisters must be conducted under similar precautions. In all cases treatment should be prompt and decisive. First let a correct diagnosis or opinion of the *nature* of the disease be formed, and afterwards the treatment must be skilful and energetic.—*Ed.*]

EMPHYSEMA OF THE LUNGS.

Few animals present a more pitiable appearance than cows when suffering under this affection, and few cases prove more perplexing to the owner and even veterinary surgeon under certain modifications.

The *Causes* are not definitely known, the few opportunities that have been given for scientific observation having failed to admit of sufficient investigation. Most probably, hereditary taint and mode of feeding are the chief; the former by conferring some defect of the lungs or nervous system, and the latter inducing morbid pressure upon the lungs, and interference with both in their functions.

Symptoms.—When the lungs have not become extensively disorganized by the lesions hereafter to be described, few (if any) intelligible signs are exhibited, and as an inevitable consequence irreparable conditions bear a close and extensive relation to the manifestations to which they give rise. It may be almost said with certainty that, as soon as definite signs are made known to the owner, the animal is past recovery. Medical aid, to be of service, should be sought much earlier than is usually done; but to insure the practice, much more general and reliable scientific information must be embraced by the stock-owner and his attendants, and the services of

veterinarians should be secured more in accordance with the design of prevention than of cure.

When the case first attracts the notice of the attendant, a considerable diminution of the milk has taken place ; after which the udder is small, soft, and flaccid, the teats appearing long and pendulous. Considerable wasting of flesh is also apparent, and the coat stares ; the skin is dirty, and bound down tightly to the tissues beneath. The bowels are now noticed to be irregular ; and it may, perhaps, be elicited, in close cross-examination, that these signs—together with a capricious appetite—have been negligently allowed to proceed under the belief that nothing serious was being fore-shadowed. The animal now eats little or next to nothing, except hay, and rumination is observed to be somewhat irregular. The appearance of the eye is not much altered, being tolerably bright, open, and active. The ears are also active, but there is a tendency when at rest to carry them backwards, and even lower than natural. General countenance as usual, breath sweet, mouth moist and cool. The head is carried low, back arched and tender under pressure, and weakness is evident in walking.

So far the signs belong to the first periods of the malady. We have now to notice the second or later stage. This is ushered in by increased debility, very irregular bowels (constipation) being succeeded by a temporary and painless diarrhœa. The skin becomes yellow and scurfy, and animal heat is below the natural standard ; the visible mucous membranes are pale, and sometimes thin fluid discharges are exuded from their surface. The pulse—almost unaltered in the first stages—is now probably slow, small, and weak, numbering not more than 36 or thereabouts, while general wasting becomes more apparent and rapid.

In the latter stage signs have become intensified. Animal heat—as betokened by clay-cold ears, legs, horns, skin, and

body generally—has suffered a great decline. The appetite is now lost, rumination absent, and a passive diarrhœa, unaltered and unaffected by any medicines, continues to aggravate existing conditions. The back is still more arched, abdomen tucked up, udder small, soft, and flabby in the extreme, and milk entirely gone. (Fig. 78.) The limbs are apart, assuming a straddling position ; and sometimes the fore ones are placed

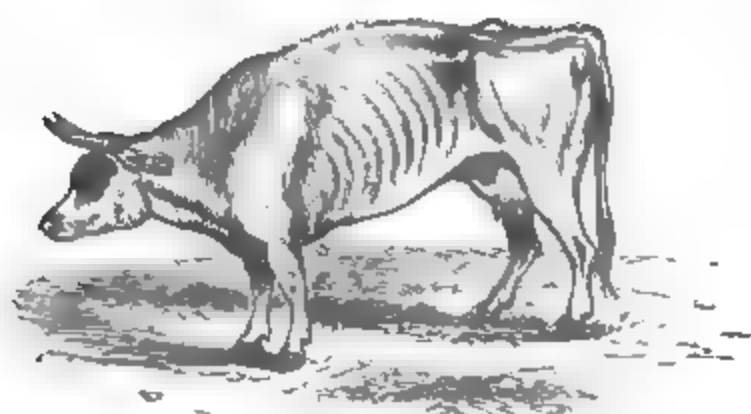


FIG. 78.—*Emphysema of the Lungs.*

considerably backwards under the body. The head approaches the ground and the nose protrudes, the sufferer being very much disinclined to move, and tremors are evident in the

flank, thighs, and fore-arms. The pulse is weaker and smaller, but not much increased in frequency ; but as the diarrhœa becomes more profuse and offensive, and other signs acquire urgency, the circulation grows weaker, the body is, if possible, still colder, weakness prevails, the animal totters, falls, and—with a few gasps and passive struggles—dies, after having puzzled the owner, attendant, and quack in a most remarkable degree for upwards of two or three months.

There are several signs, which being present in most active diseases, lead to a correct diagnosis ; such, for instance, as accelerated respiration, hard and full pulse, dilated nostrils, reddened membranes, &c. In the disease we are now attempting to describe they are absent, and in their place are conditions which, to the superficial and ordinary observer, appear to involve the case in greater mystery. The pulse is infrequent—not more, as we have already said, than about 36—the beat is slow, but the calibre of the artery is small, and

by slight pressure we may interrupt the current altogether. What are we to understand by these? The slow and weak beat points to the heart debilitated in action and deficient in power to contract on a proper volume of blood, as well as some impediment to the general flow. If we examine more closely, the venous pulse will be observed to extend upwards to the jaws when the head is held upwards. We now know that the right ventricle of the heart does not empty itself at each contraction, it therefore receives less than usual, and thus the circulation is impeded, weakened, and embarrassed. Where is the great obstruction? It is not in the heart: the interruption that occurs there is only of a secondary character—or, in other words, due to something else. Let us examine the respiratory organs. The nostrils are passive, respiration slow, numbering not more than 15 to 17 per minute, and so regular and silent that motion is scarcely recognized in the act. If the ear is applied to the sides, the usual murmur of health is absent, and when we resort to active percussion, the healthy resonance mockingly assures us there is no consolidation, as we had almost confidently decided. We next give the animal a little brisk exercise, if she is able to bear it, and go over the plan of investigation again with no better success.

The scientific veterinarian, however, calling to his aid the almost infinite resources of physiology, discovers ample reasons in these passive, yet negative, signs. In the respiration he perceives a destruction of the elastic power of the lungs, by which they are emptied and inflated with great difficulty,* to a loss of nervous force as a result of improper circulation and imperfectly purified blood, consequent upon the obstruction within the lungs, as evident by the venous pulse.

The *Nature* of the disease will now be best understood by reference to the

Post mortem Appearances.—All parts of the muscular system

* See the diagram and descriptive text of the nature of the lungs at page 151.

are pale, flabby, and softened. Small blood-vessels contain thin uncoagulated blood. Digestive organs mainly healthy, except small intestines, which, in consequence of the diarrhœa, are somewhat reddened. The lungs are pale, extremely light, and inflated throughout by air, which is readily observed to be collected beneath the investing membrane in numerous and variously-sized cavities, forming large bladders, and when the fingers are passed over them, their size is augmented or diminished, and slight crepitus is heard. When the organs are placed on water, they float considerably *higher* than healthy lungs, and if weighed will also be found lighter. In several instances the writer has found the lungs, when emphysematous, to be one or two pounds lighter than the same organ of another animal identical in breed and size, but healthy.

By further and more intricate examination we discover valuable additions as proofs of the nature of the malady. The lungs are divided by a knife, and the appearances as given in the accompanying woodcut are demonstrated. Larger and smaller cavities are present, which prove to be either enlarged air-cells, or, from the pressure exerted, a number of cells have suffered rupture, and, coalescing or joining with each other, form them. Within the lung tissue, or that network which surrounds the air-cells, other ruptures have occurred, and these also by enlargement and coalescence induce the formation of large *bullæ* or bladders, which exhibit the greatest difficulty in discharging the contained air, even after continued drying. When the inflation is confined to the air-cells and beneath the pleura, the form of emphysema is known as *vesicular*; but when the lung tissue is the seat, it is then characteristically known as *interlobular*. Both forms are commonly present in cattle at the same time, though one may predominate.

The microscope reveals further conditions, which the tutored mind will have already anticipated. The blood-vessels are very scanty. In consequence of the enlargement of air-cells,

pressure is exerted upon them ; the walls are brought together, circulation is stopped, and eventually many of the vessels, thus rendered perfectly useless, are absorbed. The general pulmonary circulation is thus diminished, and further obstruction occurs from the flow being confined to few vessels, and even those suffering from pressure on their external surfaces. We also see in this fact a solution of the condition which explains why the lung tissue in extensive emphysema is devoid of congestion and evidences of inflammatory action.

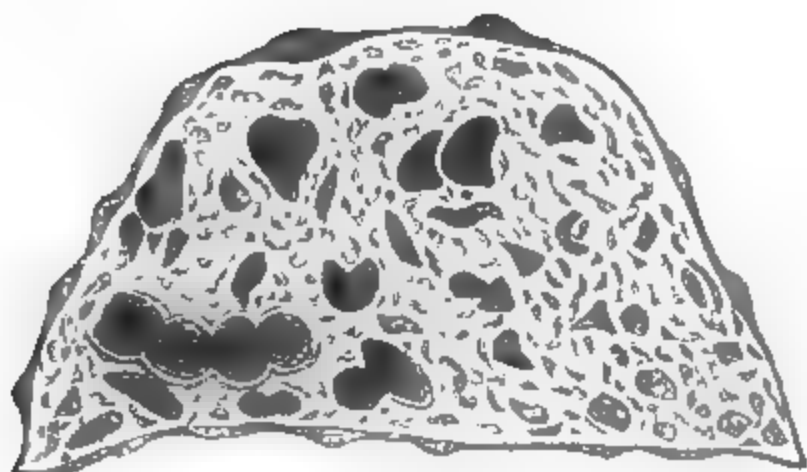


FIG. 79.—*Section of the Lungs,*

Showing the Enlarged or Ruptured Air-cells, and large cavities formed by coalescence with each other, as well as the appearance caused by an Elevation of the Pleura or Investing Membrane.

It is also remarkable that in all confirmed cases of emphysema of the lungs the thorax appears rounder and wider than natural. Ample reason for this exists in the increased size of the organs, which, incapable of being reduced to former and original dimensions, causes the ribs to stand straight, instead of obliquely, out from the vertebral column. In this also we discover the cause of the almost motionless respiration when both lungs are affected, and the unequal size, as well as action, of each if only one organ is diseased.

The heart always suffers when emphysema has become a confirmed state. The ventricle of the right side is liable to hypertrophy, in consequence of the great exertion demanded from it in order to propel the blood over the system against considerable resistance in vessels that do not empty them-

selves sufficiently rapid. After death the walls are found to be enlarged, hard, firmly contracted, cavity empty, and walls closely approximated. This condition is best observed on a transverse section being made through the organ.

The ventricle of the left side is affected somewhat differently. The walls are usually thin, soft, and flabby, the cavity being thereby enlarged (dilatation), and contains a mass of partially coagulated blood. The cause doubtless rests in the fact that this cavity, under the disease we are considering, cannot empty itself so completely as in health, the pressure and diminished circulation proving an insurmountable barrier to that end ; hence also the reason for the venous pulse.

Treatment.—The most unsatisfactory results are derived from treatment of animals under confirmed disease. At best the principles to be laid down are those only which are admissible towards alleviating the urgency of symptoms as they are developed. With the desire to, and hope of, restoring the proper pulmonary circulation, or flow of blood through the lungs, the mere administration of drugs would be fruitless and even damaging. The animal should be kept still, every domestic comfort being secured. Food of the most digestible and nutritious kind is required, and should be given in small and repeated quantities, to prevent oppression of the lungs by a full stomach. Dry friction to the skin, with occasional sponging with tepid water, is useful, in order to assist the proper circulation and aëration of the blood. Tonics and stimulants are called for mainly ; but when urgent signs are manifest, the qualified veterinarian alone can prescribe properly when in attendance upon the case. In all slight cases—for which only medical treatment is beneficial—the efforts should be directed towards producing condition and fitting the animal for the butcher, and to discern between these and their probable tendencies the opinions of scientific men alone are required.

SECTION IV.
DISEASES OF THE DIGESTIVE
ORGANS.

DISEASES OF THE DIGESTIVE ORGANS.

[Among the sporadic affections to which cattle, sheep, and pigs are liable, there are probably none which prove more harassing than those which attack the digestive organs: at the same time, none prove so fatal. They frequently exist as idiopathic or independent affections, but are also closely in sympathy with most of the disorders of the body, when they form as reliable evidences of remote disease as derangement of themselves. They have already been referred to as such, and throughout what follows their condition will be noticed repeatedly with the same intention.—*Ed.*]

INJURIES TO THE MOUTH.

[It is a common belief that in most affairs custom sanctions the means; and because a practice can be traced to antiquity—be it ever so stupid or clumsy—it thereby claims from many a scrupulous kind of reverence. The “drenching-horn,” as shown in the figure (Fig. 80), is one of these, against which there are charges of a grave character, and others with, doubtless, aggravations of those named pertaining to the person who uses it.

Usually the horn is too large; it therefore necessitates a corresponding separation of the jaws; and if the animal shows

262 *Diseases of the Digestive Organs.*

any disinclination to yield to the measures, unsightly wounds are inflicted on the gums by an attempt to use the horn as a lever, and thus force compliance. From such a cause we have seen, after repeated drenching of cattle and sheep by means



FIG. 80.—*The objectionable Drenching-Horn.*

of the horn, the mouth has presented a most pitiable appearance—the membrane hanging from the gums in perfect rags. Teeth are sometimes displaced by the same means. Two other grave results are not uncommon where horns of the kind alluded to are in use. It is a common practice to hold up the head considerably above the body, particularly when the animal is down, an assistant seizing the horns, while the medicine is poured down (Fig. 81) as if the passage were a main sewer. Down goes the horn to the bottom of the mouth, and there the operator allows it to remain until the creature has swallowed the contents. The poor creature is thus often actually prevented from swallowing with such an obstacle in the mouth, and if the fluid does not reach the gullet before the jaws are so far separated by the horn, *the cow falls suffocated*: the medicine has passed down the windpipe. Many will say on reading this, “I have drenched a greater number of cows than this writer ever saw, yet such a misfortune never occurred in my hands. I like a horn: I always use one, and, what is more, I’ll have nothing else.” To such we reply, others have held the same opinions and resolves, yet, even after their extensive practice, have choked a cow, and only then felt the necessity for reform. The cow swallows quickly as a rule, and frequently the rapid passage of fluid takes place

before the jaws are separate, or deaths would be more common. We never know our deliverance from hidden dangers, and cannot expect others to understand a question they probably have never studied, but would advise a practical investigation. Let these operators try the same experiment upon themselves, and all we ask afterwards is care for our valuable but speechless patients.



FIG. 81.—*The usual mode by which Cows are choked.*

Careless administration of medicines also ensures the passage of solids, which frequently enter the windpipe, and, even when in small quantity, give rise to great inconvenience and disease of the respiratory organs. (See "Pneumonia.") Much is also wasted by imperfect means—of which the horn is an example—and this is very important in the treatment of disease.

The remaining objection occurs in the injuries which are sometimes inflicted upon the tongue by the sharp edge of the horn. Sometimes, however, the operator seizes the tongue with one hand and draws it to one side while the drench is being given: the molar teeth then are closed upon it, inflicting very ugly lacerations and bruises; at others, too much force is used, and being pulled too far, the power of retraction is destroyed, and the organ hangs out of the mouth

perfectly useless, and an obstruction to mastication and profit-



FIG. 82.—*Injury to the Tongue, resulting in Paralysis.*

able laying on of flesh. Cattle browsing on the hedges are liable to take thorns into the mouth as well as other foreign bodies, which become fixed between the teeth, and in motion of the jaws injure the soft parts.

Treatment.—In the minor injuries simple measures frequently answer: these consist of applying a wash to the mouth composed as follows:

RECIPE NO. 66.

Take of common vinegar	2 table-spoonfuls.
Honey.....	1 "
Water	$\frac{1}{2}$ pt.

Mix, and apply two or three times a day.—*Ed.*]

SPORADIC APHTHA OR THRUSH.

[An eruption of vesicles or small bladders, containing a limpid clear fluid, occurs in the mouth, under the above name. They are present over the lips at times, but usually over the tongue and insides of the cheeks. Great soreness and even difficulty in mastication results; the vesicles then burst, and small ulcers are left behind; swelling occurs in the tongue and other tissues, but gradually healing action takes place, and the disease disappears.

A more severe form is sometimes observed, accompanied by fever and extreme constitutional disturbance. The vesicles

Sporadic Aphtha or Thrush. 265

form throughout the gullet, stomach, and intestines; great prostration occurs, with succeeding diarrhœa and death.

Treatment.—In the simple form the wash already given (Recipe No. 66, page 264), will answer quite well, or if a stronger is required:

RECIPE NO. 67.

Take of chloride of zinc	2 drs.
Water	1 qt.

Mix, and use twice or thrice daily.

The animal should receive a laxative, and food supplied of easy digestion.

In the severe form the system may require support by stimulants, and diarrhœa will call for the use of opiates and astringents.* The great irritation under which the intestines suffer, and the loss of epithelium from the mucous lining, forbids the use of purgatives. In proportion to the extent to which prostration takes place, may be estimated the loss of the mucous covering. Assimilation and absorption is retarded, and medicines then effect more positive harm than good, unless they are of the soothing kind.

Simple or sporadic aphtha has been frequently confounded with the epizoötic form or murrain, and also with gloss anthrax or blain. In its simplest form it may be proved an incident of dentition, and confined chiefly to the young of sheep and cattle, &c. The severer form, while depending upon similar causes, is doubtless aggravated by climate, exposure, or defective management of some kind or other, through which the system is debilitated and circulation interfered with. Attacks being usually confined to one animal only in a number, and absence of all evidences of contagion, are ample signs of its being in no way connected with epizoötic causes.—*Ed.*]

* See Recipes No. 11, 30, 32, 35, 65.

INFLAMMATION OF THE MOUTH AND TONGUE—GLOSSITIS.

[In those establishments where it is the practice to use cooked food for animals, it not unfrequently happens that a supply is taken direct from the boiler to the troughs or mangers before a sufficient time has been allowed for it to cool. Careless cowmen are apt to administer medicines direct from the bottles in which they are supplied, without noticing that the instructions state the doses are to be diluted with water. Animals also during excessive thirst are apt to seize any fluid that may be at hand, and those of a caustic nature inflict serious damage; mineral acids and strong caustic alkalies also produce similar effects; and the result is severe inflammation of the whole mouth and tongue, which are considerably swollen, denuded of membrane in places, and intensely red and tender. A ropy discharge of saliva flows from the mouth; the pulse is increased, and much fever is present. The animal cannot feed, the milk decreases or disappears altogether, and the inflammation may extend to the throat and produce death.

Treatment.—Open the bowels by laxative medicine and injections, and wash the mouth with the lotions prescribed for aphtha. Let the food be soft, nutritious, and of easy digestion; but, as in the foregoing disease, when severe signs are set up, the aid of a veterinary surgeon should be obtained to superintend the case according to acknowledged principles of science.—*Ed.*]

ULCERATED TONGUE.

[Ulcers in the tongue arise from inflammation, particularly when that process has been protracted or assumed a low form. There are other causes not accurately determined, but in which, doubtless, accident may have had part in their production, combined with a feeble circulation as a result of debility, &c.

Symptoms of constitutional disturbance are not unfrequently severe at first, and particularly as inconvenience arises in mastication and the taking of food. An ulcer may spread, and in some instances more than one are present, the back part of the tongue, as well as fauces, being involved in the accompanying morbid action. The cheek is sometimes also attacked, and an opening is established through to the outside. The bones may likewise participate in the process (Fig. 17, page 63).

It is rare, however, that such states are arrived at, but a knowledge of the possibility of such should stimulate attention in all stages of their occurrence. The milder or benignant form is most generally observed, which usually gives way before proper measures.

Treatment.—The honey-and-vinegar wash may be tried in the first instances, but if stronger lotions are required, let the zinc preparation, No. 46, page 164, be applied as already directed. These failing, the veterinary surgeon will use various solid or fluid caustics, as the nitrate of silver, lunar caustic, caustic potash, chloride of zinc, the mineral acids, &c.

Internally iron tonics are useful.

RECIPE NO. 68.

Take of pure sulphate of iron, pulverized.....	2 drs.
Ground gentian	4 „
Warm ale or porter	1 pt.

Mix, and administer morning and evening.

In the malignant or severe form the acid mixtures prescribed under “*Purpura Hæmorrhagica*,” page 69, will be called for, and severe febrile states require the draughts given at page 235.—*Ed.*]

ABSCESS, INDURATION, GANGRENE, AND PARALYSIS OF
THE TONGUE.

[These states are not uncommon. All may arise from inflammation within the organ, but the last frequently occurs,

as already stated, from the absurd habit of drawing out the tongue during the administration of medicines (see Fig. 82, page 264). Surgical means are required in the first and third; for the second the internal administration of iodine, &c.; but in the latter few measures will be of any avail. The advice of a veterinary surgeon should be sought as to the most suitable mode of action.—*Ed.*]



FIG. 83.—*Compartments of the Stomachs of Ruminants.*

- | | |
|---------------------------------|--|
| a. Rumen, or first compartment. | d. Abomasum, or fourth compartment. |
| b. Reticulum, or second do. | e. Esophagus, or gullet. |
| c. Omasum, or third do. | f. Entrance to the intestines—pylorus. |

INDIGESTION AND DISEASES OF THE DIGESTIVE ORGANS.

[The stomach of ruminants is divided into four compartments, which are, first, the *rumen* or *paunch*; second, the *reticulum* or *honeycomb-bag*; third, the *manyplus*, *manyplies*, *omasum*, or *peck* of some districts; and fourth, the *abomasum*, *renet*, or true digestive stomach. Their affections will be considered separately and in order.—*Ed.*]

ACUTE TYMPANITIS IN CATTLE AND SHEEP, otherwise known as *Dew-blown*, *The Sickness*, *Blasted*, *Hoove*, *Hove*, *Fog-Sickness*, *Hoven*, or *Blown*.

This is a common complaint amongst neat cattle and is attended with symptoms of the most distressing nature. It requires speedy relief, or a rupture of the stomach or some part of the intestines may be expected to take place, which generally soon terminates the animal's existence. Fog-sickness usually proceeds from a voracious and greedy disposition incident to neat cattle when permitted to satiate their appetite with food of which they are most fond, such as red clover, vetches, rich fog or different kinds of grasses, likewise turnips, potatoes, corn, and sometimes chaff. The latter are more liable to choke the beasts, and the former to blow them.

This disease, or rather accident, requires no description, as it is well known to most cattle-keepers. Beasts are most subject to be fog-sick, hoven, or blown in the summer, and in the winter to be choked. It is possible that they may be seized with the former or escape the latter, or *vice versâ*.

This complaint (as already intimated) is in general occasioned by the animal feeding for a considerable time upon rich succulent food, so that the stomach becomes overcharged, and they, through their greediness to eat, forget to lie down to ruminate or chew the cud. Thus the paunch or first stomach is rendered incapable of expelling its contents; a concoction and fermentation take place in the stomach, by which a large quantity of confined air is formed in the part that extends nearly to the anus, and for want of vent at that part causes the animal to swell even to a state of suffocation, or a rupture of some part of the stomach or intestines ensues. As sudden death is the consequence of this, the greatest caution is necessary in turning cattle into a fresh pasture if the bite of grass be considerable; nor should they be suffered to stop too long at a

270 *Diseases of the Digestive Organs.*

time in such pastures before they are removed into a fold-yard, or some close where there is but little to eat, in order that the organs of rumination and digestion may have time to discharge their functions.

If this be attended to for a few times, it will take away that greediness of disposition, and prevent this distressing complaint.

[*Nature.*—Distension of the rumen or paunch by gas. The term *tympanitis* is used to denote the drum-like sound elicited by tapping the distended part of the left flank of animals suffering from the disorder. As the proper functions and secretions of the stomach are indispensable agents in true digestion, in which gaseous disengagements do not rapidly take place, tympanitis can only occur when these are suspended from any cause.

Causes.—In addition to, or in further elucidation of, those already given in the original context, we may advance the following: Sudden change of food; feeding on grass or young clover upon which rain or dew has fallen, green crops containing much water, and roots that are partially decayed or frosted. Cattle badly fed during winter, or taken from straw or other dry food, frequently suffer severely from the first meal of grass, but more especially clover. Tympanitis is common during obstructions of the gullet, or choking, and disease or impaction of the third stomach, as well as affections of the second. Lastly, tympanitis occurs as a *sign* of other diseases, and is apt to appear as a chronic affection.

Symptoms.—The indications of this disorder are usually developed rapidly. After only a small quantity of food has been taken, a swelling appears in the left flank, and symptoms of distress are soon apparent, as indicated by great depression, laboured breathing, and panting. At this stage relief may be obtained by exercise or dashing cold water over the body, which, through nervous agency, sometimes produces eructation and contraction of the walls of the rumen.

As the disorder advances, distension increases and respiration becomes more laboured, the animal moans and grunts, and, with an arched and stiffened back, declines to move. The



FIG. 84.—Ox suffering from Hoven.

eyes become bloodshot and prominent, saliva drivels from the mouth, suffocation is imminent, blindness and insensibility come on, the creature staggers and eventually falls, the contents of the stomach being ejected through the nostrils.

Treatment.—One of the most efficacious agents in relieving tympanitis is a pure solution of gaseous ammonia, largely diluted with *cold* water. It may be combined as follows :

RECIPE NO. 69.

Take of liquor ammonia.....	1 oz.
Cold water	1 qt.
Essence of ginger	$\frac{1}{2}$ oz.
Or tincture of cardamoms	2 „

Mix, and administer carefully without delay.

The action of this agent is undoubtedly due to its power as a nerve stimulant, restoring secretion and action of the stomach. The opinion generally entertained that this compound and chlorinated lime are specific chemical agents possesses but slight foundation. The gases generated are of a *mixed* character, and do not consist wholly of definite kinds at separate stages, as usually taught. One kind, however, may preponde-

272 *Diseases of the Digestive Organs.*

rate over another, but the whole is far from being a pure gas. The secret of success consists in *arresting* the process of fermentation, and promoting the proper functions of the organ. By means of the latter, the gases are dispelled in eructation or through the intestines. Ammonia and chlorinated lime act principally in these ways: the first as a stimulant, the latter both as a stimulant and feeble antiseptic, as is proved by the fact that, by their repeated administration, destruction of the existing gaseous compounds is not always effected, nor even fermentation arrested. The combinations of chlorinated lime (chloride of lime) are as follows :

RECIPE NO. 70.

Take of chloride of lime	4 drs.
Water	1 pt.

Put the lime into a mortar, and add one or two table-spoonfuls of water, and rub the mixture down to a white creamy fluid. The rest of the water is to be added during agitation, and afterwards quickly poured into the vessel from which it is to be given. Some persons also add one or two ounces of ground ginger.

The writer drew the attention of the profession to the power of the sulphites of soda in the treatment of tympanitis some years ago,* since which — many cases coming before him — he has been enabled to make more extended observations. The result is that, when tympanitis exists as a disorder of the rumen, those preparations effectually arrest it, rendering any operation for mechanical removal uncalled for.

When the compounds of ammonia and lime are ineffectual in removing the distention, it is usual to pass the probang or tube of the stomach-pump. For this purpose the cow is seized by the horns by an assistant on the left side, while a second places and secures in the mouth a proper gag, as shown in the

* "Veterinarian," Vol. XXIX., 1856, page 215.

figure. (Fig. 85). A great objection to such an appliance, when not large enough externally, is the facility with which the animal can pass the probang between the molar teeth, and



FIG. 85.—*Wooden Gag.*



FIG. 86.—*Iron Gag or Balling-Iron.*

obstruct its progress. The ordinary "balling-iron," as shown in the annexed woodcut, answers much better (Fig. 86). Thus

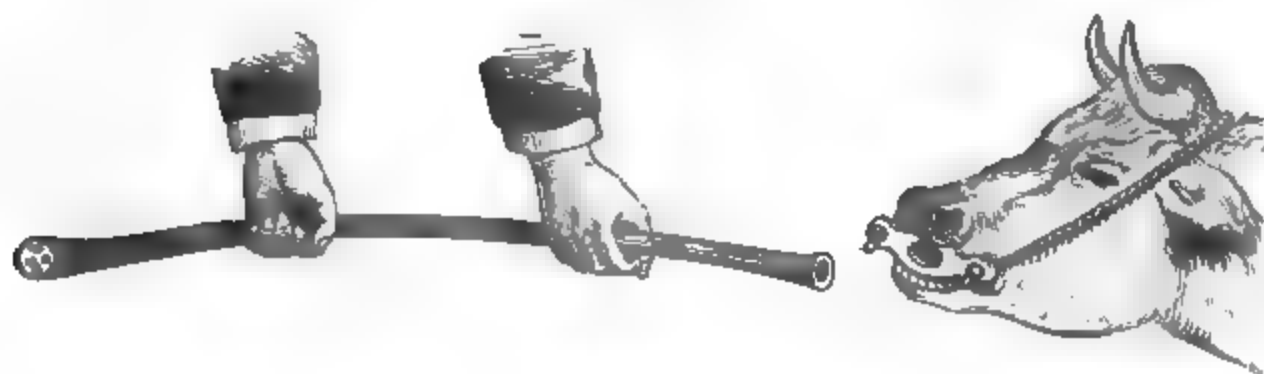


FIG. 87.—*Mode of securing the Animal prior to passing the Probang to evacuate the Gas from the Stomach.*

fixed (Fig. 87) the mouth presents a free passage. The operator then standing in front conducts the instrument along the central line of the mouth backwards. His next care is to be assured it has passed the throat into the gullet, and this will be ascer-

274 *Diseases of the Digestive Organs.*

tained by rapid examination externally, when it may be pushed gently on to the stomach. A foetid gas now escapes by the mouth, the stomach descends, and the animal obtains relief. The instrument may then be withdrawn, and the animal have its liberty.

Sometimes the regurgitation of food towards the gullet obstructs the passage of gas through the probang, or the stomach swells rapidly after it has been passed and withdrawn several times; it is then the practice to make an opening in the flank by means of proper instruments known as the trocar and canula, as shown in the annexed woodcut (Fig. 88). It is



FIG. 88.—*Trocar and Canula for puncturing the Stomach.*

a much larger instrument than that used for tapping the chest, being about eight inches long and three-eighths of an inch thick. The spot chosen for the operation is midway between the last rib and haunch-bone, and about a hand's breadth below the lumbar processes. (Fig. 89.) The accompanying engraving will afford the necessary information in addition to the description. The animal is secured by the horns, &c., and the operator standing on the left side, in advance of the hind leg to avoid being kicked, places the instrument in position and rapidly plunges it through the tissues. The stilette is immediately withdrawn and the tube left to allow the gas to escape. A string is then attached to the tube, in order that it may remain until the formation of gas has ceased. Care is required when operating that the kidney of the left side may not be injured, which is sometimes done by those ignorant of the anatomy of the parts.

If the tube is properly fitted and of sufficient size, medicines may be introduced through it to the stomach, for the purpose

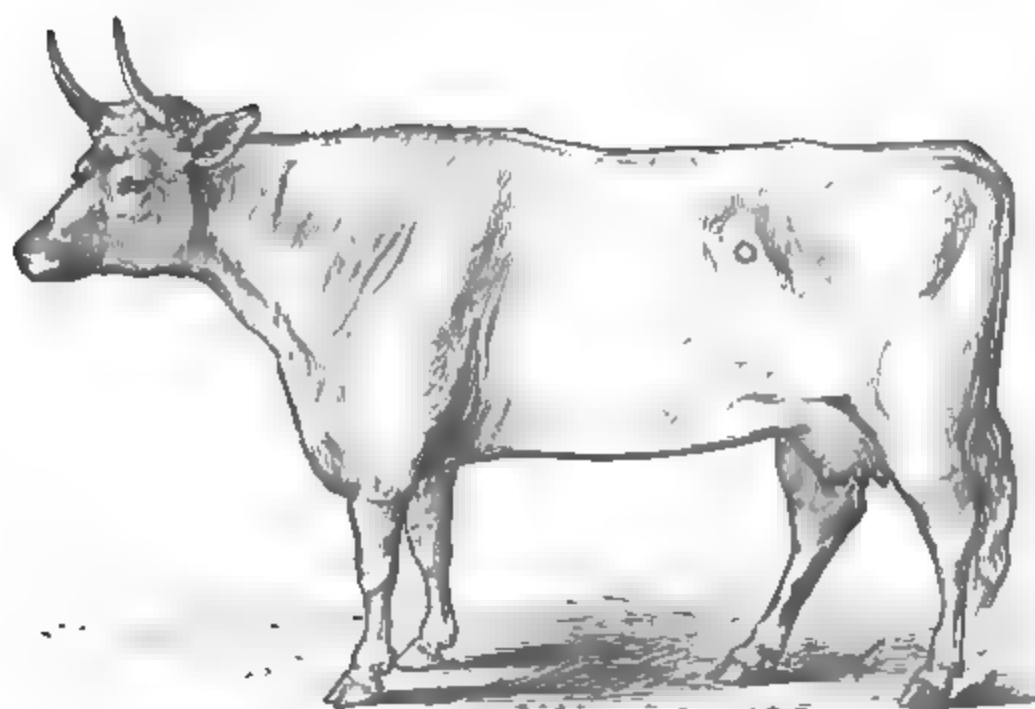


FIG. 89.—*Showing the place in the flank where the Paunch is punctured.*

of hastening the proper functions or removal of the contents. It is good practice to administer injections, and afterwards a brisk cathartic, as soon as the more acute signs are arrested. Such a mixture may be constituted as here given :

RECIPE NO. 71.

Take of Epsom salts	12 to 24 oz.
Ground ginger	3 "
Treacle	1 lb.
Warm ale	1 qt.

Mix, and give immediately.

Brandy, whisky, rum, gin, &c., are also of great service in restoring the tone of the organ. The comparative insensibility of the digestive organs of cattle and sheep is a matter which demands close attention in treating their disorders and diseases ; and the amateur will find that, without some experience of their physiological properties, but little of their morbid conditions will be understood, and resulting treatment unsatisfactory. This will occur when they are purely local in character, but still greater complexity arises when their morbid states are the result of remote disease.

276 *Diseases of the Digestive Organs.*

The trocar and canula, also the probang required for sheep, are much less than those used for the ox. The trocar recommended for tapping the chest (as shown in the annexed figure,



FIG. 90.—*The Trocar and its outer case, the Canula.*

Fig. 90) answers the purpose very well; but one having the stilette and canula two inches longer, and a quarter of an inch in diameter, proves still more efficient. The probang is not more than three feet long—the tube being about half an inch outside diameter, and one-quarter within; the bulb and cup being about three-quarters of an inch in diameter. N.B.—One-sixth or one-eighth of the doses advised for cattle are required for sheep.—*Ed.*]

CHRONIC TYMPANITIS IN CATTLE AND SHEEP.

[In consequence of irregularities in diet and other causes, acute tympanitis may lapse into a chronic form. The whole digestive apparatus lacks tone and vigour, obstructions occur, and increase the difficulties of the case, by causing a reappearance of the symptoms of fermentation each time the animal takes food. Recovery seems to take place after a time, but shortly the signs recur; and, after repeated suffering, these alternations of apparent health and disorder are generally succeeded, if not caused, by organic disease, as schirrus liver, emphysema, or consolidation of one or both lungs, abscess, or fistula of the reticulum (second stomach).

Treatment.—Remove obstructions or accumulations of undigested matter by cathartics, as already given in Recipes 12, 29, 37, 38, 39, 40, 70, conjointly with enemata. Promote digestion by tonics, particularly vegetable bitters when organic disease is ascertained to be present, as iron tonics prove positively injurious under such circumstances. Feed lightly, and

enforce regular and gentle exercise, with careful domestic management.—*Ed.*]

OBSTRUCTIONS OF THE GULLET—CHOKING.

[The lodgment of a piece of potato or turnip, &c., within the pharynx or any portion of the gullet, is a fertile source of tympanitis, and gives rise to special signs which distinguish the distress arising from that caused by distended stomach. The offending object may also be solid, hard, and possessed of angular processes, as a piece of wood, cork, leather, &c., or it may more rarely be an accumulation of farinaceous matter, dry and agglutinated by imperfect salivation.

Symptoms.—The general signs are those of uneasiness, with difficulty of breathing, continued movement of the jaws, evidences of nausea, and copious discharge of saliva. The appetite is gone, no rumination occurs, and when the animal drinks the fluid returns in a full stream through the nostrils. Gas is rapidly generated within the rumen; and, if relief is not obtained in a short time, the sufferer drops, partially if not completely suffocated.

Special signs occur in accordance with the situation of the obstruction. Three forms of choking are observed: first, *pharyngeal*; second, *cervical*; and third, *intrathoracic*.

In the *pharyngeal* form of choking the foreign body rests within the pharynx or bag at the junction of the gullet with the mouth. The head is held low and protruded, nose straight out, neck stretched, salivation is extreme, and a frequent spasmodic cough creates great distress; there is great difficulty in breathing, the countenance is haggard, pupils dilated, eyes staring and bloodshot. If the parts externally are examined, or the hand is passed to the back of the throat, the obstruction may be felt.

In the second or *cervical* form the offending body is within

278 *Diseases of the Digestive Organs.*

the gullet, and may be observed to cause a well-marked swelling in the course of the tube. Swelling of the paunch is quite as severe as in the former variety, but the general symptoms are not so urgent as in pharyngeal choking. Fluids sometimes pass readily, and this tends to favour the idea in non-professional minds that no choking is present.

In the third or *intrathoracic* form the obstruction cannot be detected by vision or manipulation. It is lodged in that part of the gullet between the bottom of the neck and the stomach, or, in other words, the chest portion of the tube. The signs are still more subdued in this form during the first stages of the malady. It may continue for some hours, or even a day or two, when great distress comes on with tympanitis, and the animal may die suddenly. One of the chief signs of this form of choking consists in an apparent freedom in drinking, when the gullet above the obstruction, being charged, is affected by spasmodic action, and the whole is ejected as in the act of vomiting by the mouth.

Treatment.—In pharyngeal choking the balling-iron should be placed in the mouth, and the hand passed to the pharynx, in an endeavour to withdraw it. This failing, the following mixture may be administered with great care :

RECIPE NO. 72.

Take of linseed oil.....	$\frac{1}{2}$ pt.
Sulphuric ether	1 oz.

Mix.

The obstruction, if not large, may pass downwards, or, in some instances is expelled in coughing after being lubricated by the oil, while prevailing spasm is overcome by the ether. Before proceeding to surgical treatment, this draught, or repeated quantities of tepid water, may be poured down in the other forms of choking also, when, after sufficient trial, success is not attained, the probang is to be used. This is a hollow tube, six feet in length, usually composed of a spiral coil of

wire covered by leather, and furnished with a bulb of metal at one end, and cup-shaped mass at the other. For sheep, one of three feet length is used, with proportionate calibre.

The cow is secured, as already described at page 273, and



FIG. 91. | *Wooden Gag.*



FIG. 92.—*Iron Gag or Balling-Iron.*

the mouth held open by a suitable contrivance—the wooden gag or a balling-iron (Figs. 91 and 92)—and the cup-shaped



FIG. 93.—*Method of securing the animal in order to pass the Probang.*

extremity is presented (Fig. 93). Passing safely into the gullet, the operator bearing in mind the precautions already given at page 273, the obstruction is reached, and by moderate and

steady pressure is pushed into the stomach, when all severity of signs immediately subsides. A form of probang, having a pair of claws or forceps at the extremity, is sometimes used, a drawing of which is annexed (Fig. 94). This is pushed care-

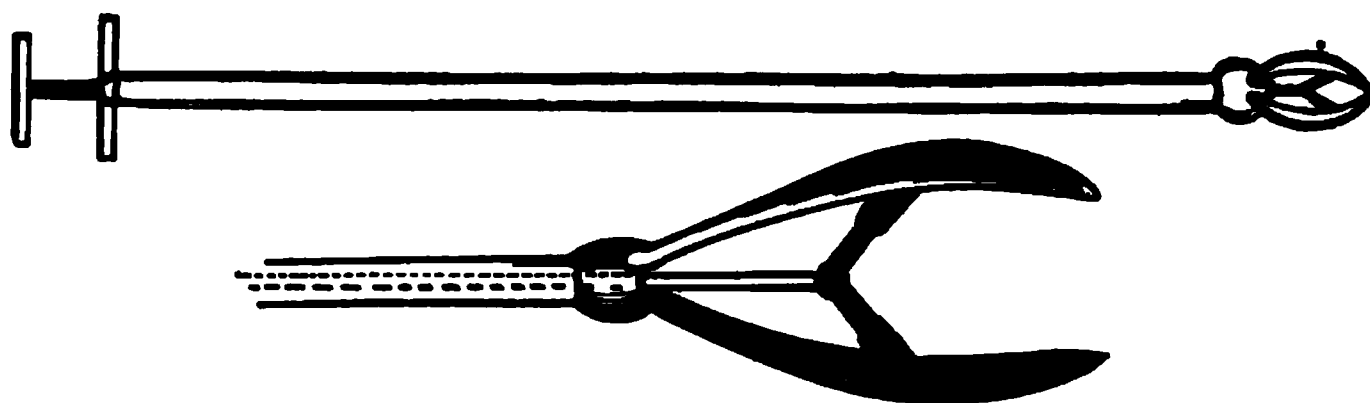


FIG. 94.—*Forceps for withdrawing pieces of Turnip, &c., from the Gullet.*

fully forwards to the offending body, and by turning the handle at the opposite extremity, the claws are dilated sufficiently, when a reverse motion closes the claws, and brings them tightly upon the piece of potato or turnip, and is withdrawn. Some amateur veterinarians are in the habit of passing down the handle of a whip, but the practice is one we feel it our duty to condemn unconditionally, as all surgical attempts, even of the best kind, to dislodge obstructions within the gullet are attended with some risk, but fatal injuries are common with inexperienced operators and such primitive and unsuitable means as those named.

Laceration of the coats of the gullet is an accident often associated with choking. It may occur prior to any surgical means being tried; and after the state of spasm has existed, sometimes rupture more easily takes place, in consequence of a weakened state of the tissues, as soon as an attempt is made by the probang. In slight cases the coats form a simple pouch or sac, and into this the obstruction passes and remains, giving rise to irritation. Choking recurs from time to time, the sac enlarges, inflammation succeeds, abscesses form, and if the animal escapes death in one of the attacks, much suffering is endured before removal is effected (Fig. 95).

Such cases at the time of their occurrence require an operation. The mass should be exposed by the knife and cleared out. The parts are then united and treated as an ordinary wound.



FIG. 95.—*Cow suffering from Sacular Dilatation of the Gullet.*

When the obstruction is removed favourably by the probang, the diet should consist of thin sloppy food, in order that the gullet may not suffer by the passage of rough solid particles. Although everything appears favourable, ulceration of the lining membrane may occur, when in about ten days or even earlier the signs of choking again appear, and may terminate fatally. Such cases require care, and more than amateur treatment. Blisters are of service externally along the course of the gullet, food must be thin and highly nutritious, and the astringent wash poured down the mouth two or three times a day :

RECIPE NO. 73.

Take of powdered alum	$\frac{1}{2}$ oz.
Tincture of myrrh	2 „
Water	1 qt.

About two or three table-spoonfuls to be poured down the throat as directed.

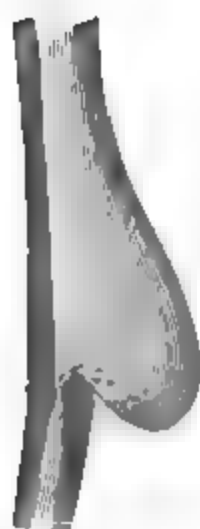


FIG. 96.—*The Esophagus after Dissection.*

Sometimes stricture of the gullet ensues from habitual choking and laceration. The tube presents the appearance indicated in the engraving (Fig. 96). The results are constant repetitions of urgent attacks, each of which may be viewed probably as the last. An opinion being obtained as to the real state of affairs, such animals should be treated on strict and cautious domestic principles, which ensure an immunity from such obstructions, and the process of fattening hastened with a view to profit. Without more than common care, they prove liable to sudden and fatal attacks at some time or other.—*Ed.*]

IMPACTION OF THE RUMEN OR PAUNCH, commonly known as *Grain-sick, Maw-bound, &c.*

[This affection is known in medical language as *Plenylvia* (*plenus*, full; and *alvus*, the belly), and arises in consequence of animals gorging themselves with food of which they are particularly fond, especially when allowed after a long abstinence from it. Others, gaining access to a heap of grain, will eat almost to bursting. Such an occurrence frequently proves troublesome, if not fatal, and from which the term "grain-sick" has originated. The organ affected is the first stomach—paunch or rumen, and consists of distension by solid matters, together with more or less stretching and paralysis of the muscular coat.

Symptoms are usually developed slowly: moist herbage and grain in large quantities may be taken before signs of disorder are evident. Distress and dulness are amongst the first signs. The left flank bulges outwards, and to the touch resembles a

mass of clay within the stomach ; it pits on pressure, or, in other words, an impression of the fist or fingers is left, and no drum-like sound is heard from percussion. Constipation is frequently established early, and small quantities only of faecal matter are passed. Rumination is suspended, the appetite is lost, and in an hour the signs acquire greater severity. The horns, ears, extremities, and body generally become cold ; the pulse is frequent, small, and feeble ; visible membranes are pale, mouth moist, and probably cool but foetid.

As the disorder advances, the head and neck are extended, breathing is impeded, and the animal lies down, on the *right*

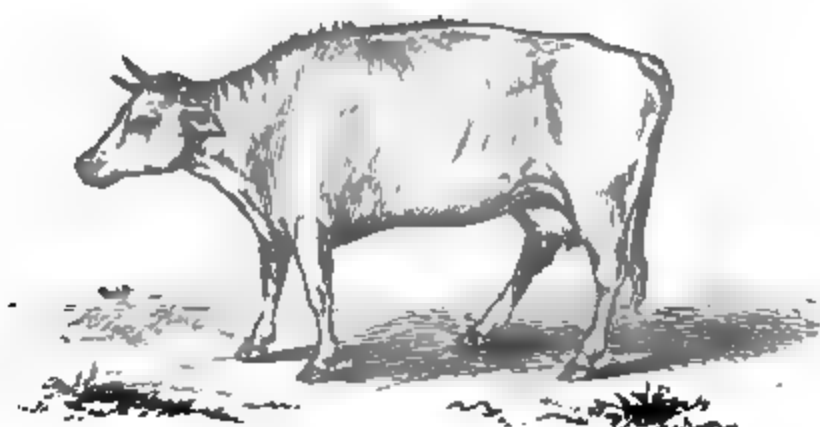


FIG. 97.—*Distention of the Rumen by Food—Grain-sick.*

side usually, but quickly rises, or stands persistently, emitting a melancholy grunt of pain at each expiration, with an occasional twist of the jaws and crunching of the teeth. Fermentation is apt to ensue, by which greater distress is produced ; the signs are now more intense, the pulse is smaller, more frequent, indistinct, and at length becomes imperceptible ; breathing is next to impossible, and the animal shortly drops dead from absolute suffocation.

Terminations are usually fatal when treatment is delayed. When distress is not great at the commencement and fermentation, tympanitis is averted, the pulse maintaining fulness, strength, and infrequency, the results may be favourable.

Treatment.—Injections of soap and water should be made

284 *Diseases of the Digestive Organs.*

use of and continued every half-hour. If fermentation has already commenced, administer large doses of ammonia (No. 69, page 271), chlorinated lime (No. 70, page 272), or the sulphites of soda ; pass the probang or use the trocar, as recommended for tympanitis.

When such adverse states are not present, let a strong purgative be given in a large quantity of fluid, as warm ale and treacle (No. 71, page 275). To this, at the expiration of one hour, give the following :

RECIPE NO. 74.

Take of liquor ammonia	1 oz.
Warm ale.....	1 qt.
Ground ginger	2 oz.

Mix.

This must be repeated every two hours until any change may be required by the signs.

When conditions—after ten or twelve hours have elapsed—assume no easier character, but rather distress, &c., increases, it may be advisable to open the paunch, an operation requiring both skill and care. The essentials for its performance are as follow :

Rumenotomy—opening the rumen or paunch for mechanical removal of the contents.

The instruments required are *scalpels tenaculæ* or *hooks*, *needles*, *suture wire*, *strong small twine*, *three clean soft towels*, *sponge*, *splinter of wood* for making quills for suture, and a *pail of clean water*.

The animal—an ox, cow, or stirk, &c.,—is to be secured with the right side against a stall, partition, or low wall ; and for this purpose at least four assistants are required—possibly more. One takes charge of the head, the bulldogs, as shown in the annexed figure, being first put upon the nose ; the second stands at the left shoulder ; the third pushes at the left haunch ; and the fourth pulls the tail from behind the partition.

Assistant No. 5 holds a tray on which are arranged the necessary instruments, and stands at a convenient distance.

The operator now commences an incision, first through the skin, at a point midway between the last rib and haunch-bone, and four or five inches below the (transverse processes of the) bones of the loins. This is extended downwards to the extent of six inches or thereabouts. The muscular layers are next



FIG. 98.—*The Bulldogs as they are applied to the Nose.*

divided in succession, and afterwards the peritoneum, when the rumen will protrude (Fig. 99); lastly, the walls of the stomach are divided at the centre—only a small orifice of half an inch being made, the lips of which are seized at once by a hook on each side in the hands of assistants previously instructed. They are to dilate the opening by gentle tension or pulling, while the operator lengthens the orifice upwards, then downwards, taking care not to make it so large as the first or muscular opening.

The gentle tension exerted by the assistants, whose hooks should have a deep hold, has the effect of bringing the walls of the rumen to overlap the outer wound, a condition which

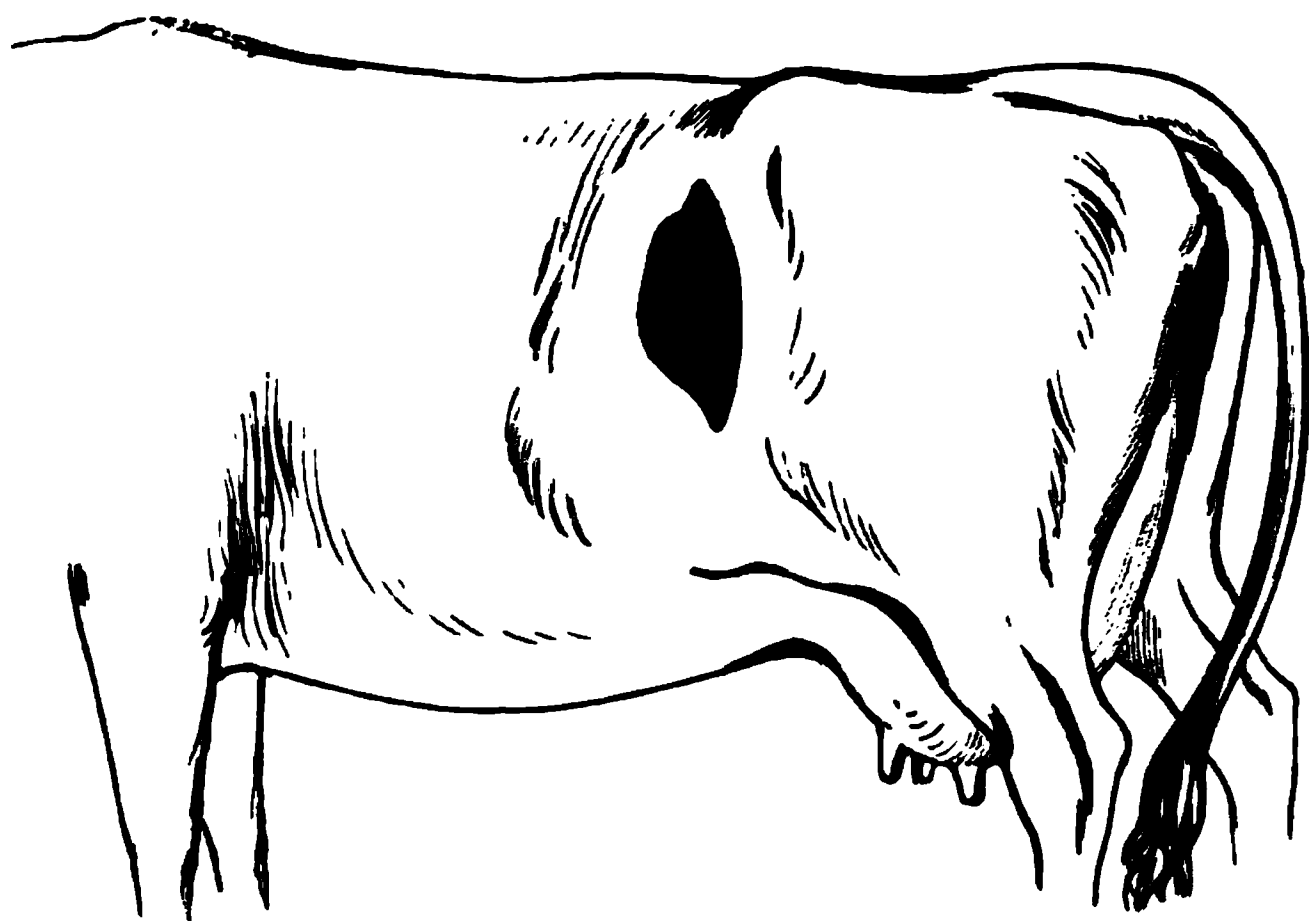


FIG. 99.—*Rumen exposed for mechanical removal of its contents.*

requires special attention in order to prevent any of the ingesta-food from entering the abdomen—an event that would terminate the animal's existence. As the stomach is opened the contents roll outwards, in obedience to the pressure from within. The hand is afterwards introduced to remove the major portion, a small quantity—but no hard and dry pellets—being left upon which the organ can contract. Warm ale, with spirits, and probably a purgative,* may be poured through the orifice. The wounds are then closed—first, that in the rumen ; second, the muscles ; and third, in the skin.

In the rumen, sutures of fine strong twine or thread are required, and the lips should be carefully brought together, the outer coat of the stomach being placed in close contact. The continuous suture is used in this instance. (See Wounds.) After it has been properly executed and the stitches secured, the end should be pushed through the orifice, that the whole

* Before the medicine is exhibited it is a wise precaution to observe the state of the other compartments—particularly the third, as upon that will depend the strength of the purgative.

may eventually drop into the stomach as it sloughs away. The muscular wound is closed by the "interrupted suture," strong twine being employed ; that in the skin by the "quilled" suture. Metallic wire or pins if preferred. The after-treatment of such a wound seldom requires more than ordinary attention, cleanliness, healing lotions, &c. (See Wounds.) The animal must be fed sparingly, the diet nutritious, easily digested, and in regular supplies. With such the case usually proceeds satisfactorily.—*Ed.*]

FOREIGN BODIES IN THE RUMEN.

[The ox tribe possess a peculiar propensity for picking up foreign bodies of all kinds, sticks, stones, dirt, articles of wearing apparel, old leather, portions of metal, &c., &c., occasionally finding their way into the first stomach. How some of these, on account of their size, reach that organ is a matter of surprise, seeing that many substances of even less dimensions in the shape of food produce obstinate choking. Young animals—calves—are fond of licking each other, and the result is, hair being easily detached by their rough tongue and swallowed, forms large round balls with an admixture of mucous, &c., by the action of the stomach. Other matters also accumulate and form by admixture, as stated, balls or calculi of a similar form.

The hair balls do not appear to produce any direct inconvenience, unless they are in large numbers. The solid substances, on the other hand, frequently weaken the tone of the organ, and give rise to indigestion and impaction. Metallic substances, as lead, is sometimes productive of serious results—moindering or lead-poisoning. The causes we are about to consider under "Dyspepsia."—*Ed.*]

also used for grazing, and cattle or sheep turned upon them pick up these foreign bodies, hence the frequency of the lesions referred to.

The *Symptoms* of the presence of such agents of irritation are frequently very ambiguous and not well marked. Mistake is very liable to occur in the attempt at arriving at a conclusion. For a long time nothing of note occurs, but at length gradual wasting has become evident, with signs of anæmia. The bowels are irregular, the skin becomes yellow and covered with scurf (dandriff), the coat stares, skin harsh and dry, appetite irregular, being sometimes ravenous, frequent eructations take place from the stomach, and flatus passes from the bowels.

The *second stage* is marked by great wasting and weakness, partial diarrhœa, decrease of milk to a minimum, small feeble pulse, but not very frequent, capricious appetite, irregular rumination, and occasional tympany of the paunch, with unequal temperature, &c.

In the *third stage* the signs are variable, depending on the formation of pus. When an abscess is forming, the animal grates the teeth, grunts, moans, is uneasy, the appetite is gone, and rumination is suspended; milk quite absent, pulse rapid and somewhat full and hard—all of which continue to augment in severity until death ensues, which generally takes place in a day or two. In the milder forms without abscess the weakness and diarrhœa increase—medicine has no control over those states: the emaciation now proceeds rapidly; the pulse is weak, small, and indistinct; temperature gradually falls below the natural standard, and the animal sinks and dies. We have known numerous instances of these chronic affections to be combined with emphysema of the lungs, but whether such has had an independent origin has not been yet made apparent.

The study of cattle diseases even at this day is not sufficiently encouraged. Practitioners are compelled to be content with what they can gather in *occasional* visits to their patients.

The quack usually commands the practice among cattle and sheep—a man who has neither opportunity nor ability to prosecute scientific investigations and decide philosophical questions one-half as much as the employer himself; the result is the educated practitioner gets few opportunities, and the department of our social economy does not progress as its importance and wealth call for. When the agriculturist can see his benefit in remunerating properly the veterinary surgeon by a system of contract, then the country districts will possess necessary talent; but as long as he withholds himself from its assistance, so long must he suffer from diseases (that admit of being mitigated or prevented) among his stock, and diminution of his balance at the bankers'. There is no profit in the veterinary surgeon making investigations at his own expense, when the cow-leech is preferred before him. When the qualified man points out that he can *prevent* disease and save the money of his clients by instituting suitable measures, he is spurned and ridiculed: his advice is grudgingly paid for; but if a cow-leech steps on the farm, he can bleed, blister, drench—charge and receive payment to five times the extent of a qualified man; and yet there has been no outlay for education: his sources of knowledge have been no more than those common to the farmer himself, which by diligent reading during three weeks at leisure times will afford him as much as the quack of forty years can know. His library is composed of the same old "Cattle Doctors" that are found on the farmer's shelves: both have the same resources, both have the same opportunities; they quietly admit of one practising and the other paying dearly for empiricisms and absolute deception in many simple matters that are believed and described to be a complete mystery.

Not long ago a farmer in the midland counties was suffering from disease among his stock, the nature of which was undetermined by himself and the cow-leech. Still he suffered

by the death of animals day after day—still he allowed the doctoring to go on in the same way as hitherto, when meeting a friend, the latter remonstrated with him for resting so satisfied with ignorance and unskilful practice, and concluded by urging him to call in a respectable and qualified veterinarian of repute. His answer was: “I’ll have none o’ your black-coated gentlemen ower my farm.” When such men—and we fear there are many of his class—ignore the advantages of sound judgment and experience in the treatment and preservation of their stock, we are bound to offer our pity, yet cannot avoid surprise when we see them daily, in a practical manner, carrying out principles which science only can explain for their guidance. Practically they are geologists, chemists—nay, philosophers—but know it not, and thus deny themselves before the world.

Treatment of the states we have been considering is not attended with satisfactory results, beyond ministering to the relief of symptoms. Where the opportunities occur for animals picking up such foreign agents, they should be avoided as much as possible. At the best they are accidents that will now and then happen, and the farmer should afford all the assistance possible in order to allow such cases to be thoroughly investigated. The benefit would be mutual and extensive. It is of importance to estimate correctly the signs of disease, but this can only be effected by the aid of a comprehensive knowledge of anatomy and physiology. If veterinary surgeons had greater opportunities to compare these with each other fewer animals would be sacrificed, and hundreds of pounds now squandered in physic would be in the pockets of the owners.—*Ed.*]

[IMPACTION OF THE OMASUM OR MANIFOLDS— *Vertigo*, *Staggers*, *Stomach* or *Grass Staggers*, *Fardel-bound*, *Clue-bound*, *Peck-bound*, *Grunting Garg* of some districts, *Swimming in the Head*, &c., &c.]

Horned cattle are subject to this disease, which is generally known by some of the above-mentioned names. The seat of this complaint appears to be in the head, although some think it proceeds from the stomach ; and this is most probably the case.

The symptoms are attended with heaviness and dulness of the whole frame, a constant disposition to sleep, which is manifested by the beast resting its head upon any convenient place. If this disease be not checked in its infancy by bleeding, evacuation, and proper management, it will probably terminate in an inflammation of the brain or on some other part of the body.

This disease mostly attacks animals that have been kept in a state of poverty and starvation during the winter season, and which have in the spring of the year been admitted into a fertile pasture : hence is produced a redundancy of blood and other fluids, pressing upon the contracted vessels, while the animal economy, on the other hand, is using its utmost endeavour to restore reduced nature to its original state. If it is not checked in the manner as stated before, inflammation in all probability must take place ; in which case the beast is attended with all the symptoms of one that is raving mad.

[From the anatomical as well as physiological peculiarities of this organ, all causes that derange the digestive apparatus act with great energy upon it. Being essentially engaged in arresting the coarser particles of food, accumulations are apt to take place which sometimes end in constipation of a very inflexible character.

Symptoms.—In those cases of gradual development we may

294 *Diseases of the Digestive Organs.*

first observe uneasiness extending over a few hours, during which the appetite is not always unimpaired. Dulness succeeds, the head and ears hang, surface heat is unequal, appetite and rumination, as well as lactation in cows, are suspended, respiration is interfered with by pressure on the diaphragm, the tongue protrudes, eyes staring and bloodshot; the animal

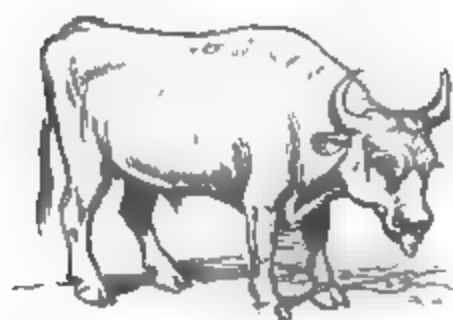


FIG. 101. — *Impaction of Omasum.*

grunts and moans, and grinds the teeth in proportion to the distress imposed; abdominal pains arise, and the nose is repeatedly carried to the right flank, while the hind legs are moved or twitched up frequently, and the tail lashed from side to side; the rumen is often acutely tympanitic, which adds severely to the distress; vision is impaired—the eyes are amaurotic, and will bear the touch of the finger without evincing pain or closing the lids; imperfect movement is evident: the animal staggers, and if tied falls forward in a most awkward manner, and eventually rolls on the side, where it lies with limbs rigid, and convulsed throughout the attack, until death terminates the sufferings.

If the beast be in pasture it runs about in utter wildness and fury, and may probably be found helplessly thrown with the back downwards in a ditch—rarely in a condition to walk after being released, but most generally dead, or suffering from irreparable damage to the spine or dorso-lumbar muscles, as a result of the violent convulsive struggles in unconsciousness.

When vertigo and delirium are delayed, obstinate constipation will be apparent. The fœces are discharged at first with some straining, and in small and frequent quantities. They are also more or less fluid. Clysters at length fail to move anything away, the straining grows more severe, and blood passes with mucous at each attempt; the urine is highly

coloured, deficient, and hot; the small intestines are irritable, and colic increases. The pulse, at first tolerably full and of natural frequency, becomes rapid during the spasms; and, as the brain is influenced, it is slow and oppressed, eventually small, feeble, indistinct, and at last imperceptible. Apart from affections of the nervous system, it becomes frequent, hard, wiry, small, feeble, and with dissolution indistinct and at last imperceptible. The disease may have a duration of only two hours, or it may extend to several days. Favourable states are indicated by a delay of brain affections, the pulse retaining a degree of strength and volume, solid flakes of ingesta being discharged with other fœcal matter by the rectum, relief from pain, &c.

A declining pulse, continuance of constipation, vertigo, and pain, are highly unfavourable signs.

Treatment should be *prompt* and *persistent*. A full cathartic must be exhibited at once, and should be composed somewhat as follows :

RECIPE No. 75.

Take of Epsom salts	1 or 2 lb.
Gentian and ginger, of each	2 oz.
Calomel	2 drs.
Croton oil.....	20 to 30 drops.

Mix with one or two pounds of treacle and two quarts of warm ale or porter, and administer with care. The probang or tube of the stomach-pump should be at hand, in order to draw off any gas that may be suddenly disengaged in the rumen, which is not an uncommon occurrence in these cases.

The practitioner will next institute precise directions for the observance of attendants, and in these point out the necessity for a regular use of enemata, friction to the skin and legs, and afterwards keeping the body warm by rugs, sacks, straw, &c. Bleeding is not called for in this affection as a rule. If, however, the proprietor wishes for it, he must be informed that, unless it is performed when the pulse is full—and that is

296 *Diseases of the Digestive Organs.*

generally before urgent signs are manifest—the death of the animal will be inevitably sealed by it at later periods. Reliance must be placed on stimulants, and, for the purpose of rousing the dormant stomach of bovine animals containing *bushels* of food, ammonia is the most useful remedy.

RECIPE NO. 76.

Take of liquor ammonia	1 oz.
Warm ale	1 qt.
Essence of ginger	$\frac{1}{2}$ oz.

Mix, and administer every two hours.

The purgative draught is *not* to be repeated, for reasons that are discussed under “Cartharsis,” at page 623; but the persistent use of enemas and stimulants is to be remembered as one of the cardinal points in treatment. The use of strychnine may be called for in addition, with other agents of the class, the uses of which are best known to the veterinarian.

In certain adverse cases, where purgation cannot be established, a pint of water, at a temperature of 99° F., may be injected into the jugular vein, the funnels, as shown in the engravings 31 and 32, page 90, being used for the purpose. The propriety of administering strychnine by the endermic method will also be duly considered. A syringe, as shown in Fig. 30, armed with a hollow needle, is charged with the fluid, and the point passed beneath the skin, when, on pressing down the piston, the fluid passes into the cellular tissue without trouble. It may also be advisable to pass the fluid direct into the blood, when it may be effected by opening the jugular vein and using the tubes, shown in Figs. 31 and 32, by means of the glass syringe, Fig. 18, page 66.

The animal should be encouraged to take large quantities of tepid water, and all solid food must be withheld until convalescence is fully established.

Galvanism may be tried in certain cases where practicable, the

current being sent from the region of the stomach to the anus.

Post mortem Appearances.—The third stomach is impacted; the leaves closely pressed by cakes of hard, dry food; their blood-vessels are injected, epithelium peels off, and probably ecchymosis is found upon them, as well as upon the outer walls of the organ. The small intestines are reddened or blood-stained on the peritoneal surface, and patches of ecchymosis occur here and there. The rumen is probably also well filled, and the reticulum contains fluid only; brain acutely congested, particularly at the base, over the cerebellum and medulla oblongata. In protracted cases, characterized by the absence of cerebral complications, the ingesta, near the canal on the floor of the omasum, is probably softened or semi-fluid, and the lining membrane of the abomasum, with that of the small intestines, exhibit the inflammatory wreath or halo, as a result of the action of medicine that has passed through the omasum and excited an increased peristaltic motion. Such a state is known as “Alvitis.” The intestines throughout are generally empty or contain fluids; the lungs and liver are more or less congested; and the right side of the heart contains blood in tolerable quantity when the lungs have suffered acutely in the attack.—*Ed.*]

OBSTINATE CONSTIPATION IN PIGS.

The internal conformation of these animals resembles that which obtains in the human subject. Unlike cattle and sheep, they have only one digestive compartment, which performs the whole of the functions assigned to the stomach. The pig is then a mono-gastric animal, or having a single stomach. As in other animals, inflammation of the stomach (gastritis) may occur; enteritis, or inflammation of the intestines, also takes place, or the two may exist in combination as a result

298 *Diseases of the Digestive Organs.*

of irritants generally. Diarrhoea, dysentery, and constipation are also witnessed in consequence of the operation of known causes, those already named under the respective heads as applying to oxen and sheep being as fruitful sources among pigs.

The most common affection is constipation, arising from the excessive use of a highly-stimulating food without taking sufficient exercise. The *Symptoms* are very characteristic. At first the animal is dull and refuses food, being desirous of avoiding his companions, and with that view hides himself beneath the straw or in a dark corner of the sty. When required to move he is obstinate, and will bear punishment before rising to his feet: he walks crampy, and emits a painful grunt or scream as he walks. The anus is clean and firmly contracted, belly tender to the touch—pressure upon each side causes the animal to scream violently, and rush away and lie at a distance. The invariable position is with the abdomen upon the ground, fore limbs straight out, nose drawn towards the chest between the limbs, hind legs beneath the abdomen. (See Fig. 39, page 115.)

The pulse is rapid, full, and hard; membranes are injected; abdominal pains ensue; the animal frequently rises and lies down, screaming or grunting in a distressing manner; the urine is deficient, highly coloured, and ammoniacal; bowels constipated. If relief is not obtained the signs increase; the pig becomes frantic, and fits of apoplexy may supervene, terminating life abruptly. At other times the abdominal pains increase, diarrhoea ensues, but prostration has become so great, and obstruction to the circulation by reason of pressure so extensive, that the animal dies in great agony, at times varying from twelve to twenty-four hours from the period of attack.

Treatment. — Success can only be obtained by an early attention to the case. The animal should receive a brisk purgative after the subjoined form:

RECIPE NO. 77.

Take of Epsom salts	2 to	4 oz.
Powdered ginger.....		1 dr.
Ditto gentian	2	„
Calomel	5 to	10 gr.

Mix, and give in thick gruel according to the instructions detailed at page 295.

Enemas of warm soap and water should next be continued every half-hour until relief is obtained. In order to hasten the operation after medicine, a stimulant may be administered in two hours, which may consist of

RECIPE NO. 78.

Take of spirits of nitric ether	2 to	4 dr.
Essence of ginger	1	„
Tincture of belladonna	1	„

Mix, and give in half a pint of warm ale.

Friction should be applied to the skin, and general comfort provided. The food allowed at first must be sparing, laxative, and supplied at regular intervals; the drink, tepid water, with a small quantity of oatmeal, linseed-tea, &c. The animal should be allowed room to roam about, and attention to the state of the food, in order to avoid a recurrence of the evil. —*Ed.*]

CHRONIC INDIGESTION—DYSPEPSIA—IMPAIRED
DIGESTION, &c.

[This condition—principally incidental to the fourth compartment of the stomach—has hitherto been confined to, or rather arrogated by, man, and denied to the lower animals. What we have been inclined to regard as indigestion in the cow, sheep, and pig, under deficient observation, is really the aggravated conditions of a form which has been entirely overlooked. As long as animals ate and rested, they were considered as being in health. No difference has been observed

between a normal or healthy and an abnormal or depraved appetite. The first signs, being slight, are too frequently disregarded, and help in an aggravated form of the disease may prove fruitless.

Dyspepsia frequently occurs in all animals, the causes being bad management in its various aspects. These are irregular modes of feeding, inferior food and housing, confinement, exposure, deficient ventilation, and all agencies that tend to obstruct the functions of the skin, and through it by sympathy, the digestive and assimilative functions. During winter, when food is not good, and in wet seasons and marshy districts—when herbage is scarce, inferior, and indigestible, weather cold and stormy, and no shelter at hand—dyspepsia is common. It is the forerunner of acute diseases, and calls for prompt attention to the

Symptoms.—At the early periods of the complaint, the noticeable signs consist merely of an irregular and slightly diminished appetite. Shortly it assumes a depraved character, and the animal evinces a desire to lick the walls, stones, woodwork—take up dirty straw, sand, stones, dirt, eventually dung and even filth of all kinds. Such acts cannot exist long without the results upon the system being manifest in a most perceptible manner. The preference for things of these kinds, having no nutritious elements in their composition, must end in giving none to the support of the body. It therefore suffers unmistakably.

The coat begins to stand upright; the skin is harsh and dry to the touch; the dung is smaller in quantity, hard, dry, and glazed with mucous; flatus is passed by the bowels; flank hollow, except during slight tympany that occasionally exists; animal heat is variable—usually low; and the creature often presents a most miserable appearance (Fig. 102). Loss of flesh is not always evident in the early stages, but frequently occurs in a great degree in advanced cases.

The terminations of these are very variable. In some the blood is considerably reduced, or otherwise affected by a defective assimilation, and particular states are induced—known as “cachectic conditions.” In one, rheumatism may be contracted—the bones, fibrous tissues, and serous membranes becoming the seat of disease; in a second, the bones assume another disposition, and that to become weak and friable; while in a third tubercular consumption is not uncommon. Diarrhoea and dysentery occur in others, or they are carried off more speedily by the acute forms of indigestion, as tympanitis, impaction of the rumen, colic, &c.

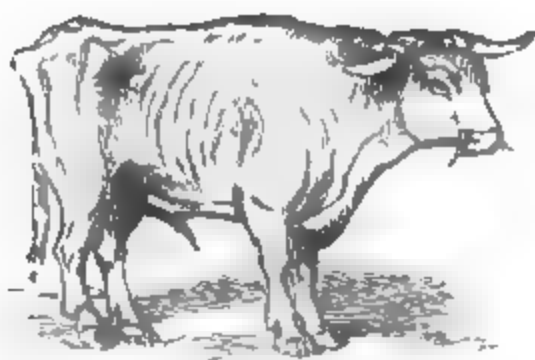


FIG. 102.—*Chronic Indigestion.*

We have already discussed rheumatism and tuberculosis: our attention will, therefore, be directed to the other affections.

Treatment.—Simple dyspepsia should receive immediate attention, with a view to its removal and the institution of proper means for its prevention in the future. The causes should be clearly ascertained, and on their removal the sufferer must be gradually placed under the influence of proper conditions. Animals brought up from low, wet, and marshy lands should be placed in sheltered straw-yards; and those having bad or deficient food must be supplied with small and repeated, but gradually increased, quantities of nutritious aliment. At first this should be of a laxative character, which may be effected by mixing bran, cee'd linseed, &c., with the food, or allowing moderate quantities of roots, green food, &c.

Cleanliness must be attended to: a pure supply of water is required, and the skin should be brought into action by sponging with tepid water and applying friction afterwards. In

302 *Diseases of the Digestive Organs.*

adult cattle, calves, and pigs this is of great importance, and would be materially facilitated by the Roman bath where practicable. Sheep should receive regular and gentle exercise to effect the same purpose.

The medicines required are very simple and should be given cautiously. The forms given below may answer in most cases, but the veterinary surgeon will judge in accordance with the signs and conditions as to a selection of remedies :

RECIPE NO. 79.

Take of liquor potassæ (solution of caustic potash)... 1 dr.

Mix with half a pail of water for each affected animal daily. Sometimes the following may be given morning and evening :

RECIPE NO. 80.

Take of carbonate of soda	2 drs.
Sulphur.....	$\frac{1}{2}$ oz.
Gentian.....	$\frac{1}{2}$ „

Mix.

In more advanced cases the preparations of iodine and iron, quinine, &c., &c., will be called for; but upon their use the advice of a veterinary surgeon is required.—*Ed.*]

DROPPING THE CUD.

[Under the above name, a condition affecting cattle and sheep is frequently observed in some districts. It prevails somewhat extensively at times, and partakes of the character of an enzoötic affection in the wide-spread nature of its distribution. We have known a whole flock of sheep and a great number of the cattle upon one dairy farm, and those of others adjoining, simultaneously affected, by which milk and condition was rapidly and seriously affected.

Nature.—From the observations we have been enabled to make, this affection appears to be dependent upon a state of

dyspepsia associated with the first and second compartments of the stomach, doubtless the result of feeding upon unwholesome food and acrimonious plants.

Symptoms.—The animal exhibits no severe signs of constitutional disturbance. The bowels may be observed to be somewhat irregular, and the coat stares a little; the appetite appears to be as usual, but during rumination the food is gradually, and in repeated quantities, successively dropped from the mouth. We have known a stone trough, near which a cow thus affected has stood about two hours, to have received as much as a large pailful of a thick green fluid which she has dropped in rumination.

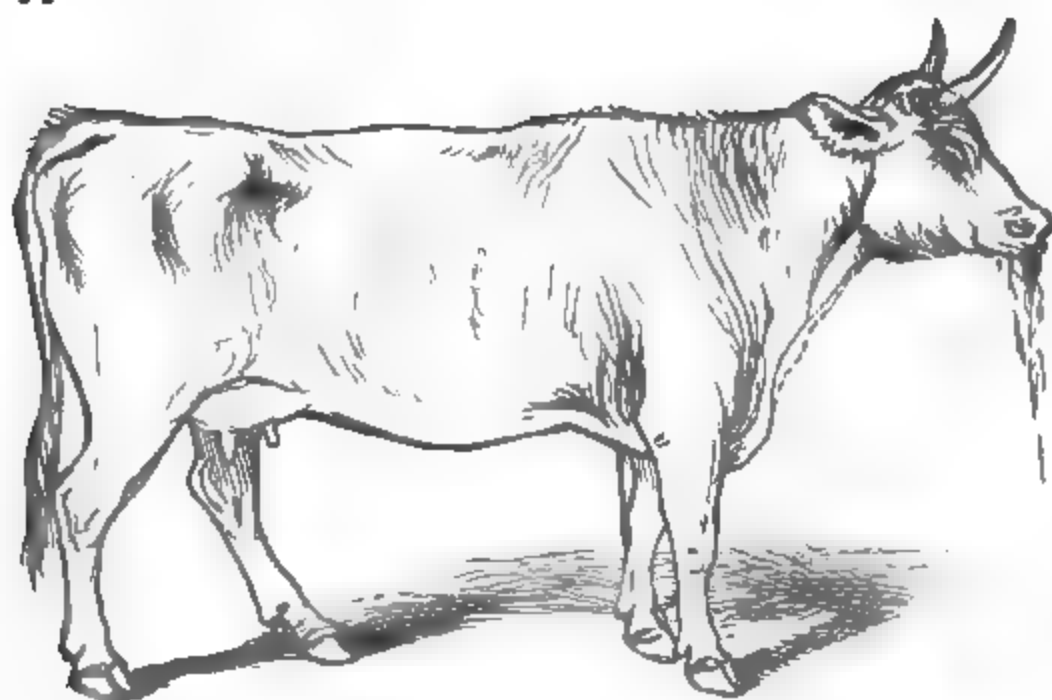


FIG. 103.—*Dropping the Cud (Indigestion or Dyspepsia).*

In cases of longer standing, the condition and milk suffers considerably; the appetite becomes capricious, and, together with rumination, ceases; and signs of anæmia, terminating in dysentery, appear. Sheep suffer in a similar manner, and the wool sometimes is shed; and from a flock in which the members generally suffered, one large portion of the field in which they were depastured was completely fouled by the ejected matter.

304. *Diseases of the Digestive Organs.*

Such animals would lick stones, walls, and woodwork, and exhibit altogether that state ambiguously termed “an unthrifty appearance.”

Causes.—The writer found in one instance that sheep so affected had fed on decayed turnips; another lot, as well as cattle, had received the leaves of mangold-wortzel; and other cows had grazed upon a bare pasture where rushes abounded largely. The latter animals were allowed also the run of small copses in which grew the common wood-sorrel (*Oxalis acetosa*). Whether the conclusions arrived at, viz., that the indifferent turnips, leaves of mangold-wortzel, and common wood-sorrel, had a prominent part in the production of the disorder, is correct, we leave for further observations to refute or confirm. However, acting upon the opinion, measures in accordance were instituted.

Treatment.—The irregular bowels were corrected by laxatives in the cows, each receiving the following:

RECIPE NO. 81.

Epsom salts	12 oz.
Gentian	1 „
Ginger	1 „
Carbonate of soda	1 „

Mix, and administer in a quart of warm ale.

The food should be carefully selected, and consist of sound roots, green food, or hay, with an admixture of oil-cake, corn, bran, &c., and a powder of the following ingredients, given each morning in the provender, or used as a drench by mixing it with gruel or beer:

RECIPE NO. 82.

Take of carbonate of soda	4 drs.
Ground coriander seeds	2 to 4 „

Mix.

The administration of this medicine may commence the day after the purgative is given, and continue during at least six days. If the animals are confined in cow-houses, small pastures,

folds, &c., and food supplied them there, they should receive a little exercise by being driven daily to and from more distant pasture, or placed in a higher, drier, and larger one.—*Ed.*]

FRAGILITY OF BONES (*Cachexia ossifraga*).

[This affection is variously known as “The Cripple,” “The Stiffness,” “Malacia,” &c., and prevails in many districts where the causes of dyspepsia are present. It would appear that a deficiency of phosphatic salts and ammoniacal principles in the soil has much to do with the generation of the malady in question.

Symptoms.—The depraved appetite and other signs of dyspepsia are present in their fullest extent. The milk decreases and becomes thin, watery, and of a blue colour, yielding little

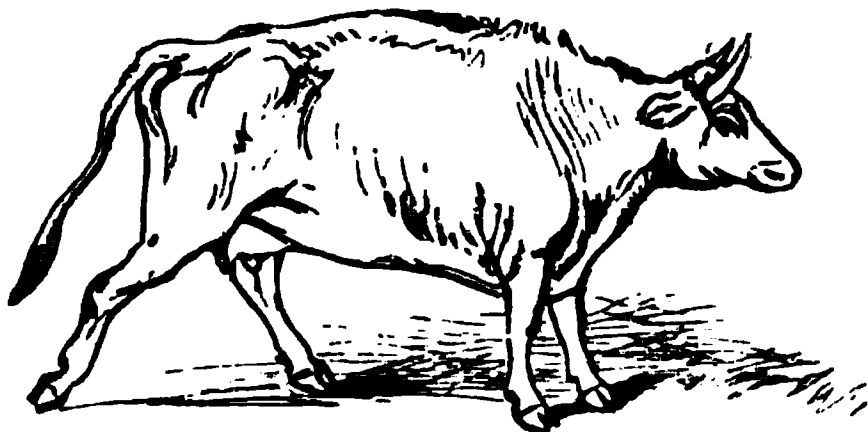


FIG. 104.—*Fragility of Bones—the stiffness—a result of Dyspepsia.*

or no cream ; emaciation proceeds apace ; the pulse, although rather full, is frequent and feeble, and the heart's action is loud and at first strong, while anæmic murmurs are also heard. The animal becomes stiff, rises with difficulty, drags the hind limbs in walking, and maintains a disposition to lie as much as possible ; wasting proceeds rapidly, the joints swell, the animal evidently suffers pain ; if made to move, the legs cross and strike each other, and there is great difficulty in standing. It is not unusual for the ligaments uniting the joints to give way—they are absorbed, and the bones slip out of their places ; fractures take place repeatedly in the same animal in conse-

quence of the friable state to which the bones are reduced, being unable to withstand muscular exertion in the slightest movement. Such fractures do not exhibit any indications of pain or tendencies to heal, and the ends of the bones, within the joints themselves, become polished by rubbing against each other. Paralysis sometimes seizes the limbs at this stage. When the appetite remains good in good milkers, the quantity of milk also continues abundant, while the body wastes extensively. In some cases pain accompanies the enlargements, and the attack is attended by slight fever; in others the lameness is alternate, but no appearances of pain or inflammation are evident. The disease may continue throughout weeks or months, and even as long as a year, but by appropriate treatment is arrested in the early stages.

The *Post mortem Appearances* are remarkable. The whole of the body is wasted, muscles pale and flabby, the blood is thin and watery, and the tissues are more or less dropsical and softened. Worms are present in large numbers in the stomach and intestines, and mucous is largely accumulated on the lining membranes, while they are generally empty and emit a sour odour. The bones are enlarged and softened, the slightest pressure causing them to crumble; and at the seat of fractures the colour indicates the absorption of blood materials. Few bones of the body are exempt from these conditions. In the annexed engravings the appearances are represented. Fig. 105 shows a fracture has taken place at a part midway in a rib, afterwards united. In Fig. 106 we have the characteristic deposit of calcareous matter, forming large bony tumours on the haunch-bones or pelvis, with obliteration of cavity of the joint, as well as deformity of the bones themselves. Fig. 107 represents the thigh-bone or femur, which has not only become involved in general deposit, deformity, and degeneration of tissue, but has also suffered fracture, and exhibits abortive attempts on the part of nature to secure union.



FIG. 105.

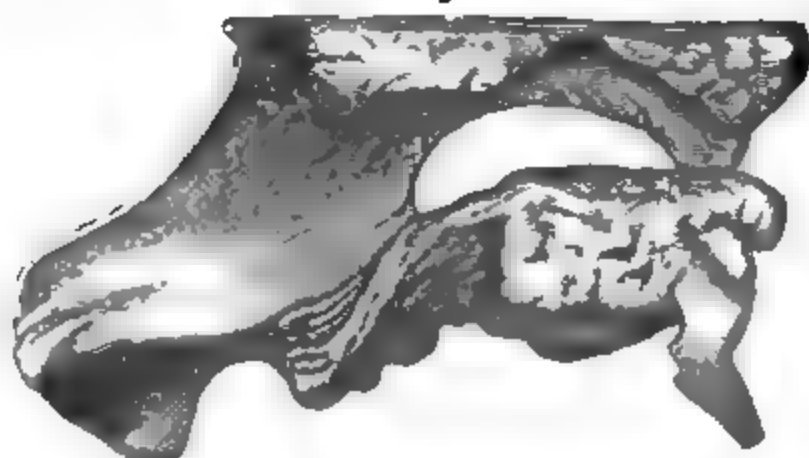


FIG. 106.



FIG. 107.

Treatment.—Affected animals must be removed from the soil where they have contracted the disease; nutritious food, in suitable quantities, at regular intervals, is imperatively called for—those rich in phosphates are most important. Linseed oil, in doses of two to four ounces, may be mixed daily with the food, or linseed swollen by water (cree'd) may be used. Some practitioners use cod-liver oil. The preparations of iron and iodine are of great service. The acid draughts, at page 69, Nos. 20, 21, 22, 31, 32, should be used with salts of lime, potash, &c., occasionally intervening.

Land upon which the disease arises is either overstocked or barren and badly manured. Artificial and other manures are needed; dressings of nitrate of soda, &c., are also called for.—*Ed.*

CONSTIPATION.

[By this term is implied an irregular discharge of fœces, which are also altered in consistence as well as quality. The evacuations are at long intervals, hard, glazy, in smaller quantity, and invariably there is more or less redness of the lining

membrane of the bowels, as well as of the eyes and nose ; in short, an amount of simple or ephemeral fever marks all slight cases of constipation.

As a rule, constipation is rather a *sign* of disease than disease itself. It is a state that should not be permitted to remain without alteration, particularly as by a change of food the liability to diseases, of which constipation forms an important premonitory sign, can often be removed by attention to diet, cleanliness, and ventilation. Medicines are not always called for, enemas, bran, linseed, and green food or roots being generally sufficient to effect the desired condition.—*Ed.*]

COLIC.

[Among cattle and sheep colic is comparatively rare as a distinct affection. More commonly it is only a symptom of other complaints consisting of spasm arising from the presence of foreign bodies, or unnatural accumulations of food within the stomach. All signs of pain in the bowels are known under the term "colic," but correctly it consists of pain without any tendency to inflammation due to severe contraction of the muscular coat of the intestines, giving rise to uneasiness, constipation, striking the belly with the hind legs, turning the nose to the flank, lying down and suddenly rising, loss of appetite, stoppage of rumination, tympanitis, diminished discharge of urine, &c. As a separate affection, treatment consists in using clysters and administration of laxatives.—*Ed.*]

• DIARRHŒA.

[This affection, common to all animals like the foregoing, is to be regarded as an indication of disease rather than existing as a malady itself, and consists of a copious as well as continuous discharge of fluid matters from the intestines, without inflammation or the accompaniment of blood.

Diarrhœa is observed as a result of several causes: First, as the effect of simple irritants; thus food in large quantity, or being inferior and indigestible, as rank grass of marsh lands, mow burnt hay, wet sloppy grass, excess of bran or linseed, habitual use of purgatives, change from dry food to green, &c. In lambs and calves a variety of worm called the *strongylus* is a serious cause of diarrhœa. (See "Parasitic Diseases.") Second, as a result of disordered digestion, good food is either modified by the morbid process or unacted upon, and it enters the intestines as an irritant or foreign body. Examples of this form are exceedingly common among calves and lambs, known in various districts as "the flux," "white scour," "skit," "scour," "skinters," and erroneously as *gastro enteritis*. Milk being exceedingly rich in quality, and probably in excess, perverts the functions of the stomach when the necessary changes in the coagulated mass are not effected. It therefore remains as an irritative agent, exciting the peristaltic motion of the bowels, and an augmented secretion of fluid, in which it is discharged from time to time, retaining its light colour, from which the name is derived. Thirdly, diarrhœa may result from disorder of the liver and pancreas: their abnormal secretions, being also in excess, act as irritants to the intestinal tube. Fourthly, it attends blood poisons generally, as purpura hæmorrhagica, malignant catarrh, tuberculosis, epizoötic pleuro-pneumonia, &c., &c., the augmented secretion from the intestines being one of the modes in which Nature's efforts of relieving herself of deleterious material in excess are manifest. Fifthly, after the long existence of diarrhœa, the tissues lose the power of absorption, and become excessive secreting agents, which, from a total absence of tone, cannot be averted. A cow affected with diarrhœa is termed a "runner out" in various parts of the midland counties.

Symptoms.—The most prominent signs are a copious discharge of fluid excrement, with considerable flatus, accom-

panied by straining, capricious appetite, occasional colic, scanty urine, cold ears, horns, and extremities, and the animal draws himself up with arched back, and feet close together (Fig. 108). If the evacuations are examined, portions of the substance causing the irritation will often be found, giving their characteristic colour. Milk, as already stated, produces light-coloured dejections, excess of bile dark brown, and preparations of iron give them a black inky-looking

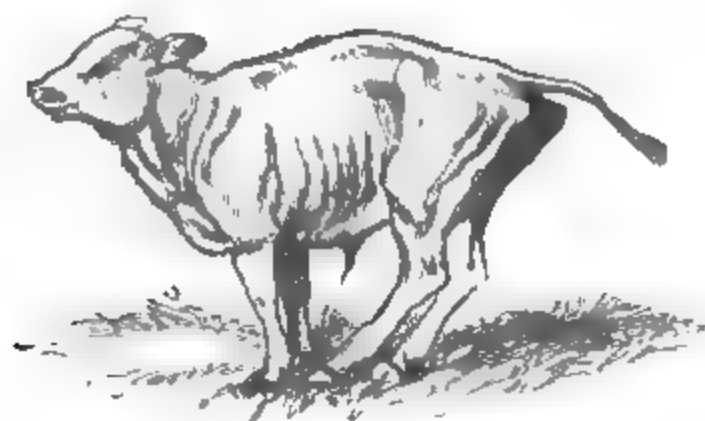


FIG. 108.—*Diarrhœa.*

appearance, with an offensive odour. The diarrhœa also of blood diseases is usually attended with very fœtid discharges, which are black. When the pancreas or sweetbread is under disorder, considerable quantities of fat are thrown out.

Post mortem Appearances.—One of the most patent and common signs that are evident in diarrhœa is a turgid condition of the mucous membrane of the intestinal tube and fourth stomach: a ramifying redness pervades the tissues, which condition is brought about as necessary to the extra secretion that characterizes the malady. Such redness is *not* the *colour of inflammation*, as commonly taught. It is merely an extra determination of blood not always amounting even to congestion; on the other hand, those states produce an arrestment of secretion rather than diarrhœa. (See “Enteritis.”) Diseases of the liver, spleen, or pancreas may exist, and prove to be the cause of the disease.

The contents of the canal vary, of course, with the nature of the food, and especially as to the part it has played. When it has existed as a cause of the malady, some quantity may be found. This is the case particularly with wet, sloppy grass, and other inferior articles of diet. In calves and lambs that suffer from diarrhœa while they are suckling, masses of coagulated milk are found : these have evidently not suffered the influences of the secretions of the fourth stomach, and are, therefore, not capable of being sufficiently elaborated by the fluids of the intestines. Their presence proves a source of irritation, and an extra but morbid secretion, as well as muscular action, is aroused in order to assist in their expulsion. The functions of the fourth stomach are generally suspended, secretions are perverted, and an unusual paleness and wasted appearance of the tissues is evident. Any discoloration, as before stated, is due to *turgidity* of the mucous membrane, but decidedly *not* inflammation.

Death arises from ultimate suspension of the functions of the digestive organs and arrest of assimilation, weakness and emaciation from excessive discharges—the very reverse of health.

Treatment.—Much as the principle of treating simple diseases by any stereotyped or given combination of remedies, or the so-called recipes, are to be condemned as unscientific practice, that of giving directions for diarrhœa in any animal, and at all stages, is a proceeding that calls for still greater condemnation. Proper remedies for disease can with certainty only be made out when the stages of the malady are decided, and the nature of the patient, with a variety of other circumstances, accurately weighed. General principles for the treatment of diarrhœa consist of the following :

Irritants are found to be common causes, therefore they should be cleared from the bowels when they are known to exist. For this purpose a regular administration of enemas

312 *Diseases of the Digestive Organs.*

are useful ; non-irritating agents are particularly valuable. Bland purgatives, as oil, are of immense service, but they require great care and judgment. Some persons have even resorted with benefit to salines. In all cases, however, food should be diminished, the quantity of water limited, and exercise discontinued until a proper action of the bowels is secured.

In some instances opiates and astringents are called for by a peculiar condition which is established, and proving difficult to manage. Mercurials also are indicated as in the subjoined form :

RECIPE NO. 83.

Take of calomel.....	1 dr.
Powdered opium	1 „

Mix, and give in thick gruel to an ox, and repeat in about forty-eight hours if necessary. We subjoin other forms, of which the practitioner can make choice as circumstances may require.

RECIPE No. 84.

Take of prepared chalk	12 drs.
Powdered kino	2 „
„ opium	$\frac{1}{2}$ „
„ gentian	2 „
Warm ale	1 pt.

Mix. Such a dose may be repeated in twenty-four hours if required, or the following substituted:

RECIPE No. 85.

Take of powdered opium	2 drs.
„ starch	4 oz.
Sulphuric ether ..	1 „
Cold ale	1 pt.

Mix. By substituting tepid water for the ale, the mixture may also be used as an injection with immense benefit.

RECIPE No. 86.

Take of prepared chalk	$\frac{1}{2}$ oz.
Powdered opium	1 dr.
„ starch	2 oz.
Cold ale	1 pt.

This and the preceding may be administered to full-grown oxen twice or thrice daily.

RECIPE NO. 87.

Take of tannic acid	$\frac{1}{2}$ dr.
Powdered gentian	1 oz.
Warm ale	$\frac{1}{2}$ pt.

Or,

RECIPE NO. 88.

Take powdered columbo and angastura bark, of each	6 drs.
Sulphuric acid	12 „
Tincture of cardamoms	2 oz.
Water	22 „

A wine-glassful to be given three or four times daily. This and the preceding are valuable in diarrhœa attended with weakness.

In that form which accompanies blood diseases, solutions of permanganate of potash, carbolic acid, chlorine, chlorinated lime, &c., should be administered and used also as injections.

The following are suitable for calves, sheep, lambs, and pigs :

LAXATIVE MIXTURE.

RECIPE NO. 89.

Take of Epsom salts	2 or 3 oz.
Carbonate of soda	2 drs.
Powdered ginger	2 „
Warm ale	$\frac{1}{2}$ pt.

Mix. One-half for lambs.

RECIPE NO. 90.

Take of tincture of rhubarb	4 oz.
Powdered ginger	2 drs.
Warm ale	4 oz.

CORDIAL MIXTURES.

RECIPE NO. 91.

Take of tincture of rhubarb	1 oz.
Tincture of cardamoms	1 „
Carbonate of soda	1 dr.
Brandy	1 oz.

Mix, and give in 6 or 8 oz. of warm ale.

314 *Diseases of the Digestive Organs.*

RECIPE NO. 92.

Take the white of 1 egg.
 Rennet..... 2 table-spoonfuls.
 Milk..... 4 oz.

Mix. These may be given twice or thrice daily.

ASTRINGENT MIXTURES FOR CALVES, SHEEP, LAMBS, AND PIGS.

RECIPE NO. 93.

Take of prepared chalk 1 oz.
 Powdered catechu or kino..... $\frac{1}{2}$ „
 „ ginger..... 2 drs.
 „ opium..... $\frac{1}{2}$ „
 Peppermint water $\frac{1}{2}$ pt.

Mix, and administer three or four table-spoonfuls morning and evening ; half the dose for lambs.

RECIPE NO. 94.

Take of compound tincture of catechu or kino,..... 2 oz.
 Tincture of cardamoms 2 „
 Carbonate of soda 2 drs.

Mix. Larger animals require half the quantity, lambs and smaller ones a quarter. May be given in warm gruel or ale.

RECIPE NO. 95.

Take of sulphuric ether 2 drs.
 Tincture of opium 1 „
 White of egg..... 1 oz.
 Water 6 oz. and 5 drs.

Mix. Dose, one wine-glassful. Three-fourths or one-half as required for a sheep, pig, or lamb.

RECIPE NO. 96.

Take of powdered opium 2 grs.
 Tincture of cardamoms 2 drs.
 Sulphuric ether 20 to 30 drops.
 Linseed-tea or starch gruel..... 4 to 6 oz.

Mix. This is a dose for a sheep or pig. Half will be sufficient for lambs, but calves will require an additional half quantity.

RECIPE NO. 97.

Take of tincture of catechu.....	2 drs.
Tincture of opium	1 oz.
Chalk mixture	4 „
Peppermint water	2 „

Mix. A dose for calves, two-thirds for sheep and large pigs, one-half for smaller sheep, pigs, or lambs.

Another preparation is in common use, viz., alum whey, prepared by mixing together half an ounce of powdered alum and two quarts of milk, and boiling them for about ten minutes. The mixture, after being strained and allowed to cool, is ready for use, and is given twice a day to calves, and proportionately to other animals. It is also useful as an injection, together with mixtures of starch or wheaten flour and tincture of opium in water. Gruel made with starch or wheaten flour is also good for the patients to drink.

In all cases of diarrhœa, the greatest attention should be paid to the mode of feeding, together with the quantity as well as quality of food, cleanliness, warmth, and ventilation. Without these particulars the medical treatment may be reduced to a state of perfect uselessness.—*Ed.*]

DYSENTERY.

[This is a common affection among the ox tribe as well as sheep and pigs. In addition to the above title, the malady is known by others in the dialact of certain districts. Animals affected with it are spoken of as being “scanterers,” but the term is indiscriminately applied also to those suffering from diarrhœa. Dysentery is also known as the “bloody flux” or “running.”

Nature.—The disease is essentially an inflammation of the mucous membrane of the bowels, which relapses into a dangerous form, and is attended with ulceration and hæmorrhage, hence the term “bloody flux.”

316 *Diseases of the Digestive Organs.*

Two forms are observed: one the effect of irritants of an active, acrid, or chemical character, or as a result of blood poisons, generally confined to young and adult animals having at the commencement some vigour of constitution, and is described as the "acute form." The second is observed in animals at the close of protracted diseases. It arises in consequence of such actions as are known to suddenly arrest the functions of important organs, as the lungs or skin, and all causes, as bad food, exposure, filth, &c., that devitalize or lower and prostrate the system. This is the "chronic form," and is mostly confined to old animals, whose constitutions are most susceptible to the above influences.

ACUTE DYSENTERY.

Symptoms.—Among cattle the first signs are those of severe general constitutional disturbance, which are frequently preceded by repeated shivering-fits, dulness, with clammy mouth, furred tongue, variable temperature of the body, rapid pulse, having a greater degree of fulness and hardness than natural at first, but becoming smaller and wiry. Sometimes a discharge takes place from the eyes, at first thin, but eventually muco-purulent in character. The coat stares, is harsh and dry, and the animal is hidebound; cows lose their milk; there is disinclination to move, and pain is evinced when the skin over the spine is pinched. The back is arched, pain is evident in the bowels, the animal is uneasy, grunts and grinds the teeth, draws the limbs together, and strains with tail extended, discharging a small quantity of thin, watery-looking fluid, with an admixture of blood. Shortly the pain within the abdomen increases, straining is more violent, by which the anus protrudes and is very red in colour; the urine also acquires a deep colour; gaseous distension takes place in the rumen, and not unfre-

quently produces states of a perplexing and still more rapidly fatal nature.

If the animal escapes death by suffocation from sudden tympanitis, his subsequent existence is likely to be one of misery and protracted suffering. Signs of emaciation are apparent, which proceeds apace; dulness is evidently great, and thirst almost insatiable. If water is supplied, or the

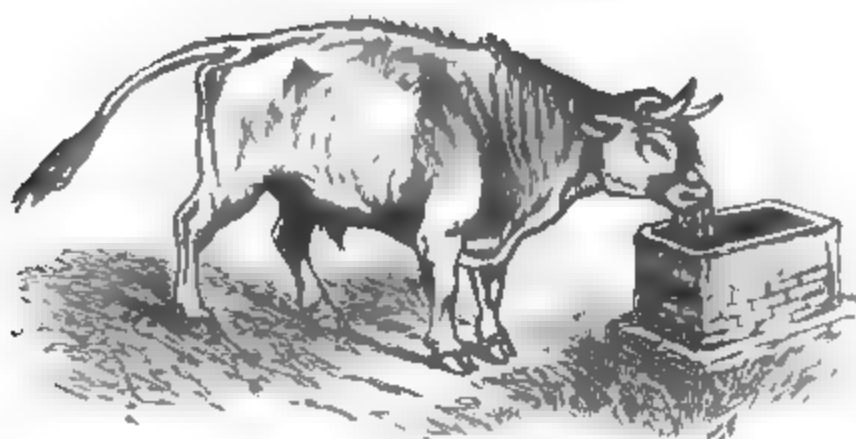


FIG. 109.—*Acute Dysentery.*

sufferer gains access to a pond, &c., he blindly rushes, plunges the nose deeply, and drinks with extreme greediness, for which in all probability afterwards he pays the full penalty of death by suffering from fermentation within the rumen. The appetite—capricious from the first—is now absent, and rumination is suspended. Vesicles appear inside the mouth, which, after bursting, give way to ulceration and bleeding, a condition which may be taken as an example of what is really going on throughout the intestinal tube. Such is the course of the disease up to this stage; when, if no relief is gained, and its progress is not arrested, each sign becomes more intense, the pulse becomes smaller and weaker, until it cannot be felt; the thermometer indicates a rapid decline of temperature to a point far below the healthy standard—four to six degrees being not uncommon; and the animal dies after two or three weeks from the outset of the attack.

CHRONIC DYSENTERY.

The acute form of dysentery may subside into the chronic variety, when the animal becomes a most miserable object, and exists as such for a considerable length of time. The malady, however, may be chronic from the first—particularly, as already stated, when old animals are the subject, or previous disease or starvation has wasted the body and destroyed the vital powers.

Emaciation is very prominent: every bone of the body, it may be said, is seen through the skin; the animal is hide-bound, starved, and exhausted; he moves with the greatest difficulty and awkwardness of action; the legs cross and knock

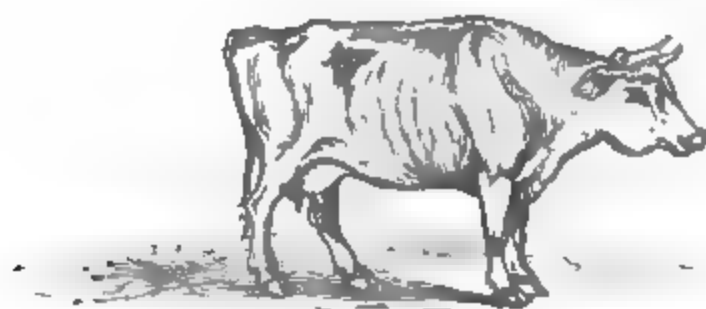


FIG. 110.—*Chronic Dysentery.*

against each other; the eyes are sunk, and a thin mucous flows from them; the membranes are pale, and the whole muscular system is soft, flabby, and attenuated; the appetite is dainty or totally absent; rumination and secretion of milk are suspended. The skin is dirty, harsh, and dry, and the hair stands erect, through which lice may be seen running in countless thousands. The space between the jaws is filled by a swelling, the result of dropsy,* and death succeeds very shortly. When the case is prolonged the dejections become extremely offensive, mixed with blood and even pus, and are passed

* Cows thus affected are said to be "choked."

without effort, paralysis of the rectum or anus having taken place; probably, also, its lining membrane is covered with ulcers, and partly involved in gangrenous states.

The *Post mortem Appearances* are characteristic. In the stomach very little food is found—the third compartment possesses the most—and the layer of mucous epithelial scales are easily peeled off, exposing beneath patches of discoloration. In the fourth compartment the folds of membrane are red, and the space between the coats is filled with a quantity of thin fluid (serum), while at others lymph is exuded, giving the whole an appearance not unlike jelly. The small intestines are sometimes only slightly affected; generally, however, an immense amount of serum is present between their coats and beneath the peritoneal membrane; internally they contain fluid. The greatest number of lesions appear in the large intestines. The mucous membrane is abraded in many parts—it is inflamed and ulcerated, and in rarer cases holes (perforations) have been formed entirely through the walls, and abscesses also in the spaces beneath the membrane (sub-mucous tissue), around which much thickening and semi-plastic deposit has accumulated. Further evidences of blood disease are present in the shape of ecchymosis and points of extensive sloughing.

The *Symptoms* in sheep are similar to those already recorded, but in addition the wool frequently falls off, and in pigs the affection has been known to be associated with “hog cholera,” as a result of inefficient drainage and prevalence of filth in the close and confined sties.

Treatment.—In this department the greatest caution and sound judgment are called for. When the patient is observed in the earliest stages, all sources of irritation should if possible be ascertained and removed by mild aperients. In the ox or cow this may be effected by the administration of the sub-joined drench:

320 *Diseases of the Digestive Organs.*

RECIPE NO. 98.

Take of Epsom salts	$\frac{1}{2}$ lb.
Gentian, powdered	1 oz.
Opium „ 	$\frac{1}{2}$ dr.

Mix, and give in a quart of linseed-tea.

The following may be selected :

RECIPE NO. 99.

Take of calomel	$\frac{1}{2}$ dr.
Opium	$\frac{1}{2}$ „

Mix, and give as above, or with oatmeal gruel.

Warm emollient clysters should follow their administration at intervals of one hour; the latter draught may be repeated in twelve hours if required, and continued thrice daily for two or three days. The practitioner will also perceive the necessity, after the acute signs are overcome, of administering metallic astringents, as the chlorides of zinc and iron, sulphates of iron and copper, alum, acetates of zinc and lead, and even turpentine. The various recipes already given under “Diarrhœa” are also required, and should be exhibited in accordance with the amount of discharge as well as the weakness present. When the want of power on the part of the intestines to absorb medicinal agents is evident, the endermic method should be adopted. The syringe and needle, shown in Fig. 30, page 90, may be used to inject beneath the skin solutions of various kinds, as strychnine, morphia, tannin, &c., &c.

When the fœces are offensive and prostration great, chlorinated lime may be used as an injection, as well as by the stomach. The following forms are recommended:

RECIPE NO. 100.

Take of chloride of lime	4 drs.
Tincture of arnica	4 „
Nitric ether	2 oz.

Mix with one quart of gruel, and administer one-half by the mouth, and use the remaining half as an injection three times a day. The following is probably more effective:

RECIPE NO. 101.

Take of pure carbolic acid..... $\frac{1}{2}$ dr.

Pure glycerine 1 oz.

Dissolve, then add

Tincture of opium $\frac{1}{2}$ oz.

Nitric ether 1 „

Mix, and administer in a pint of gruel. The same quantities may be used as an injection, each being exhibited two or three times a day.

When the signs of improvement are visible and the appetite returns, the utmost care is required in the domestic management. As in the administration of remedies, their accumulation is apt to ensue and prove an additional source of irritation, likewise is aggravation of a morbid condition likely to result from an unregulated or unsystematic mode of feeding. The food must be good, supplied in small and repeated quantities; drink is to be composed of bland and nutritious fluids, as hay or linseed-tea, oatmeal or wheaten flour gruel, also in small and regularly repeated quantities. The skin should be acted upon by wet sponges and friction, or the Roman bath where practicable; cool air, well-ventilated sheds, perfect cleanliness, and freedom from exposure are absolutely required among other observances in the routine of general treatment.—*Ed.*]

ENTERITIS—GASTRO-ENTERITIS—INFLAMMATION OF THE
INTESTINES OR OF THE STOMACH AND INTESTINES.

[The malady we are about to consider has been long known under various appellations having little or no significance, as “moor-ill,” “wood-evil,” “pantas,” &c., and since its causes and pathology have been made known and definitely accepted, the technicalities given above, with that of “enzoötic dysentery,” are justly claimed for it. The terms strictly imply its correct nature.

322 *Diseases of the Digestive Organs.*

Causes.—All substances of animal, vegetable, or mineral origin accumulating in large quantities within the stomach, or other substances, which as articles of food and in small amount would not prove hurtful, when they constitute the major portion of the sustenance of the animal become positive poisons. Enzoötic dysentery is an inflammation of the digestive track, evidently due to irritant vegetable poisoning, and as ordinary gastro-enteritis the same conditions ensue from other poisons. In nature the two states are one, differing in degree only. Poisoning in the ordinary mode usually occurs only in one or a few animals, but enzoötic dysentery, or poisoning from vegetable irritants, takes place in the cattle of a whole district, and is referable to season, producing a scarcity of natural food, by which animals are tempted to browse upon trees and various grasses, plants, &c., whose acrid properties would at other times cause them to be rejected before other varieties. Doubtless the terms “wood-evil” and “moor-ill” arose from the frequent occurrence of the affection when animals were turned on moors or pastures surrounded by woodland, in consequence of the astringent and acrid plants they obtained and preferred before the ill-grown and badly-matured grass of open and free lands, as well as those receiving little manure and labouring under the effects of wet and moisture.

Proper tillage and cultivation of land destroys the tendency to the growth and fructification of obnoxious plants, and in the face of such a fact we do not presume to notice as a cause the extirpation of moles and establishment of proper drainage, as insisted upon with great determination by shallow belief in, and superficial observation of, facts.

Symptoms.—Enzoötic dysentery is not usually developed rapidly; when irritants of a chemical nature are administered, the signs are acute. Those of enzoötic dysentery are delayed, and commence with dulness, constipation, disturbance of digestion, and hide-bound appearance. The secretion of urine is

lessened, its colour is increased, and it is voided with difficulty; milk is also arrested, and the appetite and rumination are suspended, or the appetite assumes a morbid and craving character.

These signs are soon intensified. The breathing is quickened and becomes laboured; the pulse is then hard and frequent, and shortly weak and small, mouth hot and dry, visible membranes injected and of a yellowish red colour, thirst becomes insatiable (Fig. 111), abdominal pains arise and partake

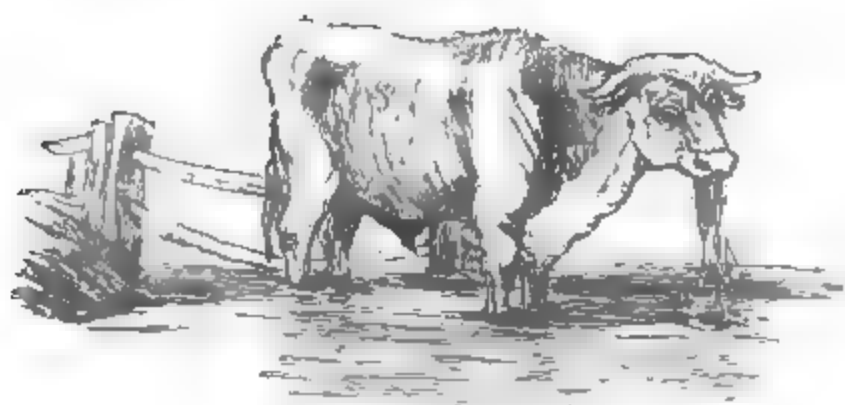


FIG. 111.

of variable degrees of intensity, varying with the amount of tympanitis that arises. The obstruction that has been placed on the process of digestion is now manifest in dark-coloured urine, having an intensely offensive and ammoniacal odour, and also probably an admixture of blood, and fæces are scanty, hard, dry, offensive, and coated with mucous and frequently blood. These signs now assume the third degree of intensity, and the animal is observed with arched back, stiff and awkward gait, obstinate and refusing to move, tender across the loins, moaning and grinding the teeth, rumen swollen from tympanitis, wasting of the whole system; he is pulseless and cold as death, and shortly afterwards dies, the time varying from one to two weeks after the commencement of the signs.

Post mortem Appearances.—The first and third compartments of the stomach are filled with food, and their epithelium

324 *Diseases of the Digestive Organs.*

is easily taken off in large masses. The mucous membrane of the fourth or true digestive stomach and throughout the intestines is acutely inflamed. There are also signs of effusion of lymph, thickening of the walls, and in the cœcum and colon are patches from which the epithelium has been removed, disclosing ulcers beneath. The canal is sometimes occupied by a large quantity of dark-coloured matter which appears to be blood material, mucous, lymph, &c., and may be drawn out in long ribbons. Rapid wasting characterizes the condition of all the tissues, and the liver is pale and frequently softened.

Treatment.—Cattle and sheep should at once receive a brisk purgative.

RECIPE NO. 102.

Take of Epsom salts	8 oz.
Flowers of sulphur	4 „
Linseed oil	1 pt.
Ginger	1 or 2 oz.
Water	1 pt.

Mix.

In order to assist the medicine, frequent enemas should be given. The subjoined is frequently of great service :

RECIPE NO. 103.

Linseed oil	1 pt.
Oil of turpentine	4 oz.
Croton oil.....	30 drops.
Warm water.....	2 pts.
Soft soap	1 oz.

Dissolve the soft soap in the warm water, then add the turpentine and agitate, then put in the other ingredients and mix thoroughly. This may be repeated or given thrice a day while constipation exists.

The animal should be allowed plenty of tepid water to drink; the action of the skin should be promoted by smart friction, with alternate ablutions with cold water and clothing, or the hot-air bath. Constipation being inveterate, the injection of tepid water into the veins by the funnels (shown in Figs. 31

and 32, page 90), or the following solution of strychnine may be passed beneath the skin by the syringe (shown in Fig. 30, page 90) :

RECIPE NO. 104.

Take of pure strychnine	4 grs.
Spirits of wine	1 oz.
Sulphuric acid	6 drops.

Mix, and when dissolved, ten or twenty drops may be used to a large ox or cow, and repeated every two hours until one grain of the salt has been administered. Each ten drops of this solution contains one-twelfth of a grain of strychnine.

It not uncommonly happens that the signs rapidly merge into a weak or asthenic form, when a stimulant kind of treatment is required to avoid the great prostration that usually follows. The following draught may be repeated or given thrice during the day :

RECIPE NO. 105.

Take of camphor, powdered	2 drs.
Sulphuric ether	$\frac{1}{2}$ oz.

Dissolve, and add

Acetate of ammonia	4 oz.
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To be given in warm ale.

When diarrhœa has set in, or the fœces become offensive, the draughts, &c., as already recommended under "Diarrhœa," are required, which may be used (repeated or varied) in accordance with the requirements of the case. Valuable drinks may be made with linseed and water, oatmeal or flour and water, and even solutions of gum, to sheathe the intestines against the acrid nature of the irritants that have been swallowed. The subsequent treatment on the subject of food will be found detailed under "Diarrhœa and Dysentery." Great care will be required in this department.

In Section XIII. will be found additional information regarding the action of poisons generally—particularly those

326 *Diseases of the Digestive Organs.*

productive of acute signs and rapid dissolution. Enzoötic dysentery (clearly an instance of vegetable poisoning) derives its characters from various conditions which do not obtain in poisoning by special agents. As a rule, the contents of the stomach are replete with plants, the botanical characters of which are as widely different as their medicinal and chemical virtues are from each other, and to the combined influences of these—forming, in seasons of scarcity, almost the entire food of the animal, with previous bad living or almost starvation, exposure and cold, over-work, filth and stifling emanations of badly-kept stables, sheds, and straw-yards, &c.—all these conspire to modify the action and its effects upon the system.

Such affections are best prevented. There is little credit to be gained by curing disease in quarters where neglect prevails and prevention is utterly ignored. Improved farming, superior tillage, and manuring of land, draining, attention to a proper selection of different kinds of food, are the secret of the principle. Over-stocking and other modes of impoverishing the land, parsimonious supplies of food, and such questionable dispensations in husbandry, are the grand cause of disease and mortality among stock; and when these are combined with peculiar geological conditions of soil, elevation, exposure, and tendencies to favour the growth of rank grasses, rushes, and poisonous plants, the effects are widely extended. It is not sufficient to console ourselves with the plea that such diseases are inevitable. That opinion has prevailed too long to the detriment of the agricultural community as producers of animal food, and the nation as consumers. Such diseases can be eradicated, and in a very simple manner. The subject becomes a question for landlord and tenant combined. While one holds out inducements for the proper cultivation of the soil by a system of secure tenancy, the other should observe the fact that even a selfish duty and common honesty forbids the impoverishment of land by over-stocking and parsimonious sprink-

ling of manures. It is a question of mutual benefit, which, well worked, would redound to national good. A more extended scientific knowledge is absolutely called for among farmers as a body. When this is acquired, veterinary science will be appreciated more generally, and something beyond mere bleeding and physicking will fall to the duties of the practitioner—he will be employed to investigate the *causes* of disease and mortality, and to *prevent* their ravages in future. The contract system should be extended to these ends. Agriculturists would then receive greater attention, and their money produce more lasting benefit. These questions remaining undecided, uninvestigated, undiscussed, unknown, and unheeded, extends our dependence upon foreign sources for live stock, diminishes our own, and places at a discount the farming interest of Great Britain and Ireland.—*Ed.*]

CROUPOUS ENTERITIS—CROUPOUS OR EXUDATIVE
INFLAMMATION OF THE INTESTINES.

[Until this disease was described by Professor Gamgee, English veterinary literature was silent on the subject. The absence of information relative to many diseases, now well known and recognized, has not arisen, as generally supposed, from scarcity of the diseases or their non-occurrence. For a long time agricultural districts have been represented by quacks, farriers, grooms, *et hoc genus omne*. Diseases occurred and deaths resulted, but the only process affected was the administration of medicines; no investigation followed; such men were incompetent to pronounce upon disease; their main object was to obtain money by the sale of their drugs; and the system being so extensively patronized prevented educated men from settling in agricultural districts. The progress of knowledge has, however, greatly cleared away former prejudices, and admitted the investigation of cause and effect by men of talent and expe-

328 *Diseases of the Digestive Organs.*

rience. Diseases have now been described because they have been observed ; and in proportion as observation is permitted and encouraged, the greater must be the benefit to all parties.

Croupous inflammation of the intestines is an affection common to the ox tribe, but there are no evidences at present against the liability of sheep to it. However, further observation is required to confirm the statement. In our present state of knowledge, the disease is of great interest to the inquiring veterinarian, and it is hoped records will be forthcoming in reference to it, in order that to our increasing scientific lore additional authoritative information may be concentrated in the proper quarters.

The disease is characterized by the free production of false or adventitious membranes within the intestinal canal at that part comprising the small intestines. At first there are the usual signs of systemic disturbance, accompanied by those of common colic or spasm of the bowels. As the disease advances the pulse becomes small, frequent, and feeble ; membranes are injected, mouth hot, respiration short, quick, and laboured ; great depression ensues ; constipation gives way to diarrhœa, in which the fœces are accompanied by much mucous and long shreds of lymph, sometimes many feet in length. The disease continues, the expulsion of membranes taking place from the fifth to eighth day, the signs prior to those times being in no wise different from the characteristic tokens of ordinary inflammation of the intestines. If death is delayed beyond the expulsion of the membranes, recovery is then usually rapid, and the animal is convalescent about the fifteenth day.

Several cases have occurred in the practice of the writer, amongst the affected animals being horses as well as cattle. Professor Gamgee considerably directs attention to the probability that the *moulten grease* of the old farriers is the disease in question.

The *Treatment* must be based on principles similar to those called for in ordinary inflammation of the intestines, the injunctions given under that head having direct reference to this affection.—*Ed.*]

PERITONITIS.

[Fortunately for the ox or cow, sheep and pig, this disease, so common to the horse, is very seldom observed among them. It consists of inflammation of the serous membrane called the *peritoneum*, which lines the cavity of the abdomen, and invests more or less the whole of the intestines, stomach, liver, spleen, kidneys, and other organs contained within it.

The *Causes* that give rise to peritonitis are wounds, the result of punctures by the horn of another animal or some pointed instrument, &c. As a rule, the origin of the disease is apparent—occult causes being rare, or productive of other affections that tend to mask the characteristic symptoms, and render the whole rather perplexing and ambiguous. It may follow the operation of rumenotomy, and that for gut-tie, as a result of the presence of some foreign body which gained access during their performance. The membrane itself, it appears, will endure a great amount of interference with the knife, but suffers from inflammation as a result of communication from contiguous organs.

Symptoms.—The animal usually stands in a most dejected manner, and endures repeated fits of trembling, that are usually confined to the hind legs and flanks; rumination is suspended and the appetite is absent; ears, horns, and extremities cold; bowels constipated, urine deficient and highly coloured; the pulse is hard, frequent, and wiry; the nostrils are dilated, respiration laboured, but the motion is confined to the chest (thoracic), the abdomen being fixed as much as possible. The animal frequently looks round to the flank, crouches and paws with the fore feet, moans, and grinds the teeth (Fig. 112);

coldness of the extremities, &c., increases; pulse becomes

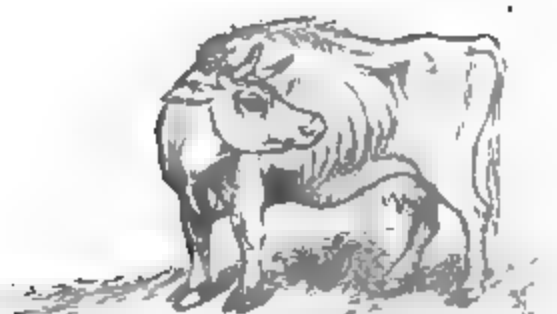


FIG. 112.

smaller, more rapid, until it cannot be felt; temperature suddenly declines from 104° or 105° F. to 97° or 95° F.; the animal crouches and lies down, and death ensues in four or five days after the appearance of the first signs.

Post mortem Appearances.—Sometimes a large quantity of fluid flows from the abdomen as soon as the walls are divided. More commonly there are adhesions of the intestines to each other by false membranes, particularly at the part occupied by the foreign body or in the vicinity of the wound.

Treatment.—This differs so little from that required for inflammation of the intestines that we purpose giving only the outlines to be followed.

Brisk purgatives (page 295) to effect an unloading of the intestines; blister (page 240) to the abdomen; enemas (page 324) every four hours until purgation is established, with others composed of soap and water every half-hour. The remaining treatment must depend greatly upon results. The following formulæ are indicated: The aconite draught (No. 59, page 235), calomel and opium (No. 99, page 320), nitre, sulphates of soda and magnesia, chlorate of potash, tartar emetic, &c., &c., are variously employed. Bleeding is decidedly unfavourable to recovery.—*Ed.*]

IMPERFORATE ANUS (*Proctatresia*).

[The anus of calves, lambs, and pigs is subject to a congenital (*born with*) malformation that gives rise to a great degree of inconvenience to the sufferer and perplexity to the owner. This is known under the above title, and consists of a stoppage

of the intestine, which occurs in three different forms. Their *nature* and the *surgical treatment* required are as follows :

1. In this form the rectum is fully developed, as shown in the annexed diagram (Fig. 113), but the outer opening—anus

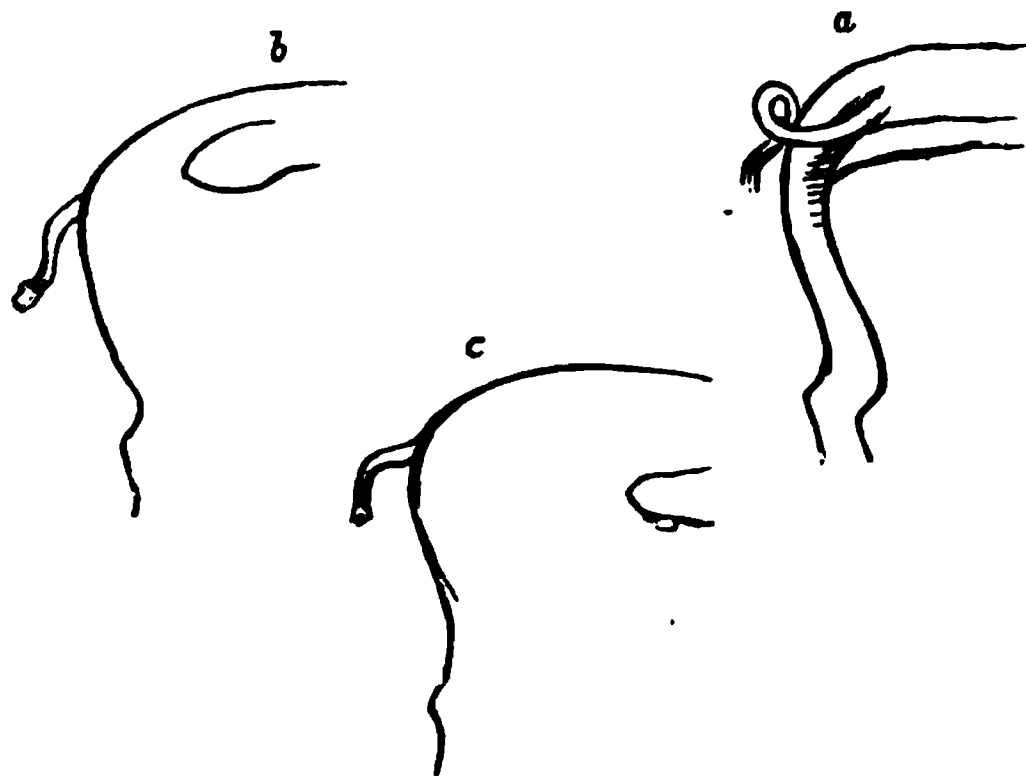


FIG. 114.

FIG. 115

FIG. 113.

or fundament—is closed by the skin. A second variety of this form occurs in which the rectum or straight gut is obstructed higher up. (See Fig. 113.)—2. Is a form of imperfect rectum. It terminates in a blind pouch (*cul de sac*) some distance in front of the usual point of outlet, which is marked in most cases by a depression (Fig. 114).—3. In this form the rectum is entirely absent. The canal terminates at a more forward part, generally at the end of the colon, which there forms a blind pouch (Fig. 115).

Surgical treatment is the only means by which relief can be obtained. In such case the passage of fœces being impassable, the animal endures the greatest agony. The condition is not usually observed for some time, particularly if the opening at the anus is intact ; but if injections are made use of, it is at once apparent in the sudden return of the fluid. Death takes place in a day or two if no relief is gained.

The plans generally adopted are as follow : In the first

form the procedure is simple. The animal (if a pig or lamb) is seized by the hind legs in both hands by an assistant, who holds the neck between his knees, the back of the pig being towards himself. Calves may be held on the ground or a raised temporary platform. The operator then, by means of a scalpel (Fig. 116), divides the occluding membrane at the spot in a



FIG. 116.—*Method of holding Young Pigs during an operation for Imperforate Anus.*

vertical manner. The cuts must be careful and well directed, as important vessels may be wounded.

When the second variety is present, the membranous septum or partition is divided in a similar manner. The forefinger of the left hand serves as a director, and a scalpel is passed along its side after being pushed close to the obstruction. At first a puncture is made, then a cut downwards, and last upwards by turning the knife round. The passage of meconium and fœces, a quantity of which pressing against the membrane has facilitated the operation, is now profuse, and by regular discharge promotes a free opening. Plugs or tents are not always required, but an injection twice a day of some healing agent is desirable. This may be easily effected by the

glass syringe or small injection apparatus (Fig. 18, page 66), pewter syringe, &c. The fluid being composed as follows :

RECIPE NO. 106.

Take of tincture of myrrh	2 oz.
Burnett's Disinfecting Fluid, or solution of chloride of	
zinc	2 „
Water	2 „

Mix.

The subjoined is particularly valuable in preventing a bad smell that may arise in consequence of suppuration, and promoting rapid healing, &c. :

RECIPE NO. 107.

Take of solution of carbolic acid (see Appendix)	1 oz.
Tincture of arnica	1 „
Water	1 pt.

Mix, and inject two or three ounces every morning and evening.

In the second form matters are not so readily managed. Some distance may exist between the proper place for the anus and the end of the rectum ; careful dissection is therefore called for. Assistance, however, must be early, or aggravations arise and end in speedy death.

The operator begins by turning the animal upon the haunches, and raising him perpendicularly from the ground. In this position he is to be held by an assistant while the parts are carefully examined. After the precise position of the loaded bowel is ascertained, the patient is gradually laid on his left side, the legs secured either by ropes or by hand. The operator now places himself at the back of the animal, and makes an incision in the place where the anus is to be, while pressure is applied in the flank in order to cause the gut to press towards the intended opening. The index finger of the left hand is caused to explore in advance of the knife, to avoid all vessels, nerves, &c., and dissection is carried in a line

334 *Diseases of the Digestive Organs.*

corresponding to the bones of the sacrum. The bulging rectum is found forwards, full and plastic to the touch, and this will serve to distinguish it from the bladder when full, or the vagina when pressed backwards during violent straining. When the pouch of the gut is reached, a free incision is to be made into it at the end, immediately after which a discharge of meconium and fœces takes place, and the animal gains relief.

It sometimes happens that these cases terminate in the voluntary formation of a passage from the rectum through the vagina in females, constituting a recto-vaginal fistula.

After the operation, treatment is in effect in accordance with details already given.

In the third form even greater difficulty exists. When the condition is found in young children, the establishment of an artificial anus is sanctioned, the fœces being discharged through the walls of the abdomen, near the groin. This could be easily effected in an animal were it desirable; but few, even on the score of value of breed, would care to have a loathsome sight on their premises as such a creature presents. There may be reasons for the first and second operations, and on that account they have been described, but we need not occupy space for details concerning a proceeding by which no real good, in the majority of instances, could possibly arise.—*Ed.*]

EVERSION OR PROTRUSION OF THE RECTUM, or *Prolapsus Ani-Exania*.

[Protrusion of the rectum is a common occurrence among cattle and sheep, but more especially pigs. The causes are violent straining during constipation of the intestines, diarrhœa, impaction of the stomach, worms, piles, and injuries inflicted in the anus or intestine. We have seen it occur repeatedly in cows, sheep, and pigs during difficult parturition, and as a

Eversion or Protrusion of the Rectum. 335

result of stitches placed across the valva to prevent eversion of the uterus or bladder.

Treatment.—The appearances of the protruding mass, and its dimensions, will in a measure direct the proper treatment.* When eversion is recent, colour bright, and of moderate dimensions, little preparatory or preliminary details require notice. The parts are merely carefully washed with warm water, and the whole pressed upon by the hands all round; while by means of a kneading action, in which the thumbs and fingers should be active, the central portion gradually returns, followed by the outer, until the whole is replaced. This operation is

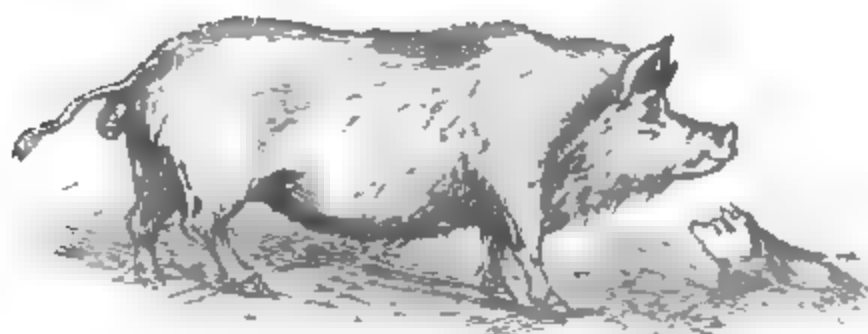


FIG. 117.—*Protrusion of the Rectum.*

not always easy, even in the slightest cases, and practice is required in order to become proficient in it. The nails should be short or pared previously, and rings removed from fingers on which they are worn.

Subsequent straining is to be checked by a full dose of opium or chloroform, chloric ether, &c., &c., as circumstances point out; and injections of the same fluids may be required. (See opiates, page 320.)

In some instances the organ is protruded six or seven inches, and swollen immensely. Incessant fomentation will then be required during over two hours, or the application of ice, astringents, &c. At other times, after delay has taken place,

* A proper examination may be made when the animal is secured as shown in Fig. 116.

336 *Diseases of the Digestive Organs.*

the rectum may be also livid, dark purple-black in colour, or injured by the movements of the sufferer. Among pigs we have known the organ to be greatly torn by the companions seizing it with their teeth. In such instances the states are more complicated, and among cattle and sheep absolutely dangerous. In the pig the organ may be returned even after severe laceration, and, if proper treatment is afterwards employed, the animal will often recover; but in the latter it is necessary to cut it off, and unite the gut to the sides of the anal opening.

The cause must be allayed or removed as soon as possible, and the nervous excitement subdued by proper medicines, before any hope of recovery can be safely entertained.—*Ed.*]

HÆMORRHOIDS OR PILES.

The whole of our domestic animals are subject to this troublesome state of disease, and of those of which this work takes cognizance cattle are the most prone to them, sheep next, and the pig last. This gradation, however, is more apparent than real. The life of the cow being of greater duration than the sheep or pig, and influenced by different actions of a morbid character, at once accounts for the greater prevalence in her species. But these statements are not intended to convey the idea that piles are a common affection: it is rather the reverse.

Hæmorrhoids or piles are the result of an abnormal development of the veins of the rectum, or sometimes also of the skin and mucous membrane at a junction with the opening of the anus, forming large bleeding tumours, and giving rise to much pain and inconvenience.

Symptoms.—The presence of such tumours form the leading characteristic, while constitutional disturbance is often great. The mouth is hot, mucus dry, pulse full, hard, and frequent, breathing accelerated; stiffness is apparent in walking; the

tail is extended, anus protruded and swollen, and the animal sometimes paws, moans, strains, and grinds the teeth; the mucous membranes become red, cows lose their milk, the animal is dejected, bowels become irregular, and emaciation proceeds. At the end of some considerable time the rectum presents a most unsightly and loathsome appearance, and the animal sinks under great prostration.

Exploration of the rectum discloses, in the earlier stages, a number of tumours containing blood. These are easily burst by pressure, which frequently takes place in the passage of fœces, or on withdrawing the hand.

Treatment.—Administer a laxative drench (p. 324), and use clysters to open the bowels; afterwards sedatives, and let the diet be of a laxative character. The local treatment consists of crushing the tumours, or excising them by means of ligatures, and applying astringent or caustic washes.—*Ed.*]

HERNIA—RUPTURE.

[Various forms of rupture are observed in the lower animals, but the species that form the subjects of consideration in this volume, having no laborious work to perform as the horse, they enjoy a comparative immunity from the occurrence. It nevertheless does take place at various times, in each of which we shall endeavour to describe the signs as briefly as is consistent with their importance. Animals suffering from this condition in any of its forms are said to be “broken-bodied” or “broken-bellied.”

The term *hernia* is used to imply the displacement of any part of the bowels or other internal organ of the abdomen and its passage, by means of an unnatural opening (rupture) into a cavity distinct from its natural position. It is also frequently employed in medical language to imply displacement of other organs, or parts of them, from their proper locality;

338 *Diseases of the Digestive Organs.*

but here we use the word in connection with the abdominal organs (viscera) only.

Herniæ are recognized as being of different kinds, in accordance with their situation, as well as the organs which form them. Each will receive a separate description. Their general characters are also remarkable as being of two kinds, viz., *reducible* and *irreducible*. Reducible herniæ are those varieties of rupture which admit of the protruding organ being returned to its proper position. Such seldom acquire any great size, and as rarely produce inconvenience ; therefore they call for no interference. Irreducible herniæ, on the other hand, are those kinds of protrusion that present obstacles against the return of the organ, except by a special operation or interference. Both kinds, but more especially and frequently the latter, are liable to assume aggravated conditions, known as *strangulation*. It occurs in this wise : when an intestine—and strangulation as a serious condition is only spoken of as applying to the bowels—passes into an unnatural cavity, certain changes take place, which modify the position of all contained, and thus pressure is applied, circulation in the protruding part is arrested, pain arises, mortification ensues, and death of the animal when no timely relief is afforded.

The changes result from a variety of circumstances. In addition to the passage of the bowel within a cavity or sac; the omentum or caul may also descend ; sometimes, by the natural peristaltic or worm-like motions of the bowels, an additional portion of intestine descends ; in other cases the original opening or rupture is small, and by inflammation is constricted and thickened, or union takes place, by false membrane, to the intestine, and thus the natural motion is limited. Each form of hernia is, then, liable to aggravation from the accumulation of fœces in the intestine, and, having a limited passage outwards, produce the effects already described as strangulation.

Strangulation of an intestine produces very acute signs of

suffering, and unless it is recognized may prove suddenly fatal in the absence of relief. The animal exhibits colicky pains of the most severe kind. Agony is depicted in the anxious and dejected look, frequent pawing, spasmodic and quick breathing, profuse perspiration, violent rolling, straining, protrusion of anus, *not even admitting of the passage of the hand or injections, or relief from drugs.* The pulse, at first full, hard, and frequent, rapidly becomes small and wiry, the mouth is hot, and membranes injected. He may suffer thus for eight, ten, or twelve hours, when *suddenly* the pain ceases, respiration becomes calm, but the pulse is smaller, and more frequently cannot be felt; the animal looks round for something to eat; at length a kind of delirium comes on, or he staggers; the legs double up, he drops as if shot, and dies in convulsions. A condition nearly allied to mortification or gangrene has taken place.

After death a tumour upon some part of the abdominal walls is discovered, that has probably escaped observation before, and when it is opened the whole cause of the affair is apparent. A portion of intestine, and it may be also other viscera, have protruded through a rent in the muscles confined outwardly by the skin. By compression they have become of a purple or black colour, and probably portions are preparing for removal by sloughing.

In all cases of colic or abdominal pains among the lower animals, great circumspection is called for, in order to prove the existence of hernia. When it is undiscovered, and treated by drugs, the animal endures greater agony, and frequently also suffers from a species of poisoning in addition.

The various kinds of hernia are as hereafter described.

UMBILICAL OR NAVEL HERNIA (*Exomphalus*).

Hernia at the navel or umbilicus is usually of the most simple kind, and in the majority of cases also exists at birth.

It is then called *congenital* hernia. Calves are most subject to this form ; pigs and sheep are more rarely affected.

The *Symptoms* consist of a soft fluctuating tumour, of variable size, at that part of the abdomen known as the navel. When



FIG. 118.—*Umbilical or Navel Hernia.*

pressure is applied upon all sides by the fingers as the animal stands, or when he is turned upon the back, the tumour disappears, and the fingers may detect an opening in the muscular walls, through which the contents have passed to and from the abdomen. In

larger animals, when the tumour is irreducible, the practitioner tests the nature of it by grasping it with moderate pressure, while an assistant compels the animal to cough, which has the effect of causing the tumour to swell rapidly with the act, and as suddenly decrease.

This form rarely becomes strangulated. In most cases the omentum or caul forms the major portion of the contents, particularly if the opening or rupture is small. In some animals it produces no inconvenience for a long time; and as the growth of the omentum is not progressive with the animal, the abdomen enlarges and descends, and the omentum is too short to reach the orifice. This condition being observed by the pathologist, his measures are devised accordingly.

Treatment.—Young animals only should be treated, except when in older ones strangulation has taken place. In simple cases, the most appropriate remedy is a proper kind of truss or bandage, in the form of harness, which provides a compress at the proper part. Such a contrivance, as exhibited in the accompanying figure (Fig. 119), is nothing more than an assemblage of straps, capable of being tightened or extended, in order to fit animals of different sizes.

In severe cases, a pair of wooden clams, as shown in the engraving (Fig. 120), is used; or others, adjustable by means of screws, and made of iron, being more preferable. By the latter, pressure is more uniform as well as certain, and

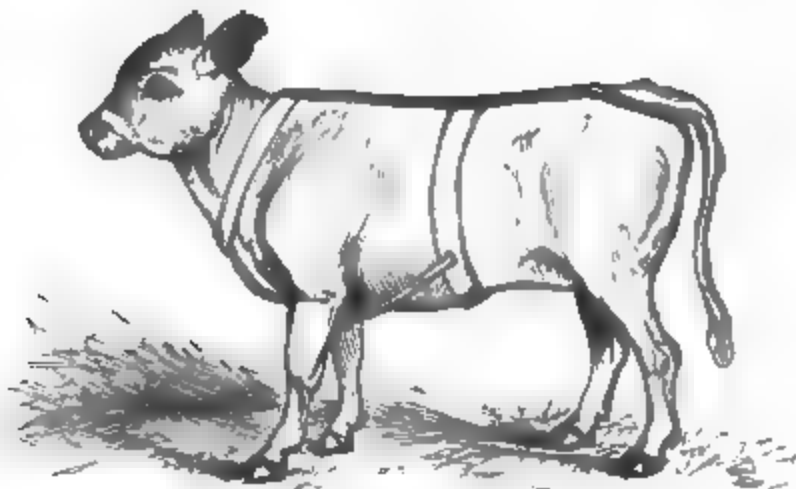


FIG. 119.—*The Truss applied for Umbilical Hernia.*

there is less liability to slip off before the work is completed. Such an instrument is shown in the annexed woodcut (Fig. 121), its efficacy being increased by a groove in one side, which

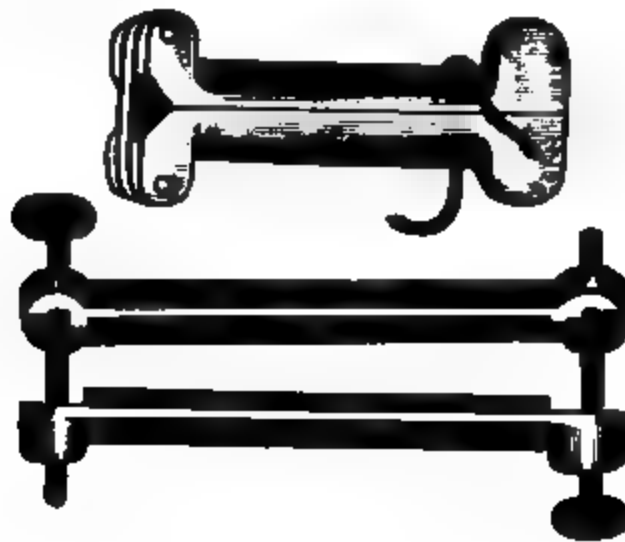


FIG. 120.—*Wooden Clams.*

FIG. 121.—*Iron Screw Clams.*

receives an elevation or piece of wire riveted in the other half. The length of the bars when put together for use is five to eight inches long.

They are applied as follows: The animal is sec

placed on his back. The skin over the rupture is drawn together by the fingers in a flat fold, corresponding with a central longitudinal line through the abdomen (*linea alba*), and elevated from the parts beneath, in order to cause the intestines or omentum to descend. The clamps are then put over the skin, as close to the abdomen as possible, and screws tightened. The pressure must not be too severe, or the parts drop off *too* soon, and possibly the intestines might escape. The operation, therefore, requires to be very carefully regulated. An empirical mode consists of passing a ligature round the skin; or, first, two needles are passed at right angles with each other through it, and afterwards the ligature below them. This proceeding is frequently attended with danger, as the intestines are included.

INGUINAL HERNIA.

This consists of the descent of intestine, &c., into the inguinal canal or passage to the scrotum or purse. An extended form is known as

SCROTAL HERNIA

in which the intestines have passed as far as the purse. Both forms are liable to become strangulated, when prompt measures are required.

Treatment.—The hand is passed up the rectum in large animals, and, on reaching the internal abdominal ring, the imprisoned intestine is seized and drawn upwards when possible. This failing, the attempt may be made, by manipulation externally, to push back the intestine, when the animal has been turned on his back; and in the event of a want of success, the sac is opened, the seat of stricture carefully incised, and the intestine liberated. The animal, if entire, should at once be castrated by the covered operation, for the whole of which a qualified man is required. Scrotal hernia is common in young

pigs. Owing to the ready union that takes place in these animals, the purse is merely stitched together at the time of castration, and the parts close securely.

VENTRAL HERNIA.

This is a form of hernia, rarely serious, in which the contents of the abdomen pass through a rent in some part of the walls, as a result of being gored by the horns, or thrown upon any projecting body. It may occur upon any part of the abdomen.

Treatment should be early if the injuries are extensive and serious. The animal is to be cast, a small incision made into the skin, and the intestines returned; the rupture in the muscles are then united by ordinary or metallic sutures, and the outer wound closed. Even very severe and extensive ruptures are thus reduced, and succeed admirably. Small ruptures of long standing require no interference. Three other kinds of hernia are sometimes observed, known as—

A. *Phrenic* or *Diaphragmatic Hernia*, in which the intestines slip through a rupture of the diaphragm or midriff into the chest;

B. *Omental Hernia*; and

C. *Mesenteric Hernia*, which are respectively ruptures of the omentum and mesentery, through which a portion of intestine passes and becomes strangulated—forms which cannot always be accurately distinguished in life. Each of these last mentioned are not very common in cattle and sheep, but occur in pigs. The signs are those attending strangulated hernia generally without the evidence of external tumours.

VOLVULUS—INTUSSUSCEPTION OR INVAGINATION OF THE INTESTINES.

These are almost impossible in cattle and sheep, but

344 *Diseases of the Digestive Organs.*

common to the pig. In the former, the arrangement of the intestines creates an immunity from the occurrence.

Volvulus or *Ileus* consists of a strangulation of the ilium or small intestine, generally arising from morbid displacement without rupture of the mesentery, but frequently by a twisting or turning over of some of the larger intestines, as the animal rolls in colic.

Intussusception or *Invagination* is the passage of one portion

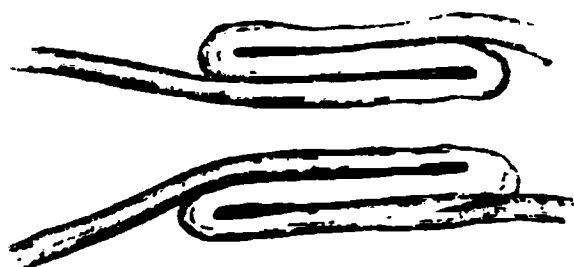


FIG. 122. — *Invagination, or passage of one part of the Intestines within another.*

of intestine within another, by which strangulation is effected, as shown in the engraving (Fig. 122). Conditions during life are mostly conjectural. The signs are similar to those of strangulated hernia, minus external tumours, admitting of no relief from

treatment, death ensuing as a result of gangrene or mortification.—*Ed.*]

STRANGULATION OF THE INTESTINES IN OXEN— GUT-TIE.

[In those districts where oxen are employed for ploughing, &c., a peculiar form of strangulation of the intestines, unknown in other animals, is occasionally observed, and recognized as gut-tie. The lesions are interesting to the pathologist, as affording an evidence of the effects of work and other influences upon animals, the ox in particular.

Nature.—After male animals of the ox tribe are castrated, the spermatic cord, when separated from the testicle, recedes into the abdomen, becomes fixed by adhesions at the abdominal ring, and is sometimes separated some distance from the pelvic bones, but united to them by a layer of peritoneum. In consequence of pressure against this membrane during work, rupture takes place, and a small knuckle of intestine passes

through, which shortly becomes strangulated. Sometimes the peritoneum passes before the intestine, forming a pouch or sac.

Symptoms.—These are as remarkable as in all other forms of strangulation. The appetite and rumination being suspended, the animal is dull, and slight colicky pains, with a full and hard pulse, are the earliest signs. Shortly pain becomes more marked, violent, and continuous; the animal strains frequently and powerfully, but no fœces are passed, the discharges being mucous and sometimes streaked with blood; he kicks at the belly, lies down and rises frequently; the back is *hollow* or arched downwards; the pulse becomes small, frequent, and wiry; the hind quarters are twisted from side to side; nose repeatedly carried to the flank of the affected side; he moans and grinds the teeth; much uneasiness occurs; the breathing becomes quick and laboured, and the animal crosses the hind legs frequently in his movements from side to side. Pressure in the flank—particularly that of the right side—gives great pain, and purgative medicines produce a great aggravation of the symptoms. If the hand is passed up the rectum and the abdominal rings explored, the imprisoned intestine may in all probability be felt. This is, however, often rather a difficult proceeding in consequence of the violent straining, from which injections cannot be retained. If relief is not obtained the animal sinks, mortification or gangrene ensues, and he dies on the third or early on the fourth day.

Treatment.—Removal of the obstruction is to be obtained only by an operation. The animal is placed against a wall or stall partition upon his *left* side, and secured by a number of strong and obedient assistants, as detailed under “Rumeno-tomy,” page 284. Some practitioners cast the animal by means of a rope, passed first round the neck, a noose being formed in the centre of a strong rope, the ends of which are carried between the fore legs, each respectively drawn through the ring upon the hobble put upon each hind fetlock, and afterwards

346 *Diseases of the Digestive Organs.*

through the rope collar upon each side (Fig. 123). The head being secured, force is applied to one rope in a line with the body, the pullers being behind, and to the other at right angles or from the side. The animal falls, and the ropes must be secured by drawing them into knots at the collar, or round the fetlocks of the hind feet. Care should be exercised in order

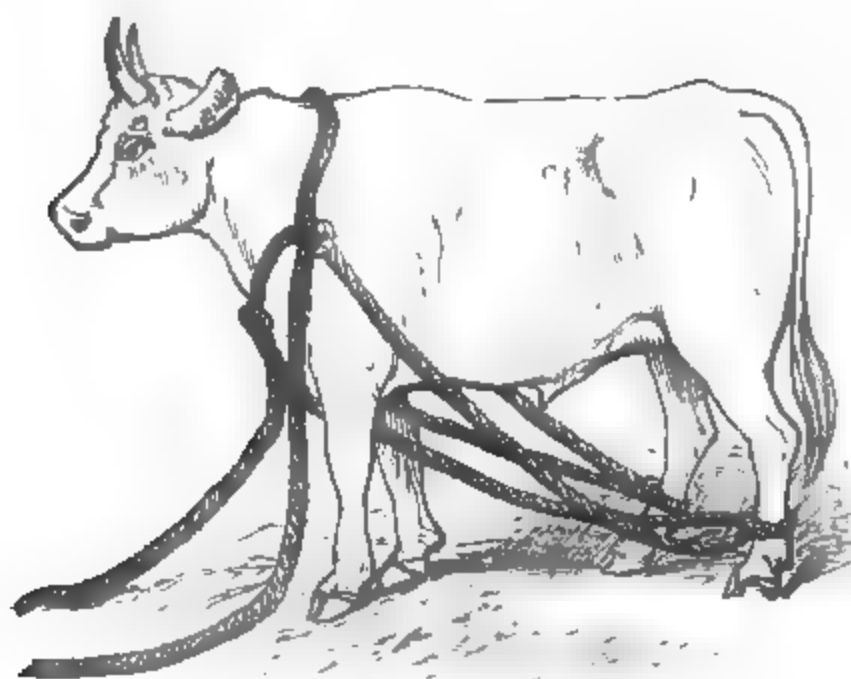


FIG. 123.—*An Ox prepared for Casting.*
a, the spot at which the incision is made in right flank.

to place the sufferer upon his left side, and it may be necessary to relax the rope of the right side that the flank may not be interfered with.

The operator commences by making an incision in the right flank, at the part shown in Fig. 123 *a*, of sufficient size to admit the hand, when the peritoneum may be ruptured. Each abdominal ring is next examined, and the spermatic cord of the affected side severed from its adhesions. The intestine is then liberated. It is necessary to bring to the outside the spermatic cord, and cut off one or two inches from the end to avoid re-union. The wound is then treated in the ordinary manner, as detailed at page 286, and the diet should consist of easily

digested and laxative food. Passage of fœces, cessation of pain, and recovery of the usual functions follow the operation.

Other means are tried with variable success when permission for an operation is withheld. These consist of causing the animal to run in a certain direction where he will be compelled to jump from a height of several feet to a lower surface. When this does not succeed, the hand within the rectum is directed to the seat of the stricture, and by carefully pushing the intestine, it may be driven back through the opening. A third method consists of throwing the animal down, and turning him sharply on the back. As already hinted, these are not always successful, and an operation is imperatively called for.—*Ed.*]

THE SPLEEN OR MILT.

[The only affection to which this organ is subject, and the signs of which are palpably evident in life, is splenic apoplexy, which has been already described under "Blood Diseases." The writer has met with it in various conditions of disease after death; but the disturbance that previously existed gave no indication by which the exact cause could be decided. Hydatids, atrophy or wasting, and even enlargement (hypertrophy) are the most common.—*Ed.*]

THE PANCREAS OR SWEETBREAD.

[This organ does not appear to be productive of a number of well-marked symptoms when suffering under disease. Until the physiology of the spleen and pancreas is more generally understood, their association with disease cannot be well observed by veterinarians in active practice. Both organs, doubtless, suffer in all cases of indigestion, but their office probably precludes each from that acute participation which we notice in other organs, as the liver, for instance.

348 *Diseases of the Digestive Organs.*

The spleen is possibly much more separate in function from digestion than the pancreas, or than is even generally supposed ; and this may clear up certain doubts and difficulties regarding its participation in disease. The secretion of the pancreas, on the contrary, is intimately connected with assimilation, and, when by disorder of the gland it is withdrawn, the fœces contain a quantity of fatty matters ; and upon correction of the whole function of digestion, the natural secretion of the pancreas is restored, and the fat ceases to pass away as stated.

Abscess, tuberculous and cancerous deposits, and hydatids have sometimes, but rarely, been found in this organ. More commonly small white masses, of the size of a pea, are discovered in considerable numbers throughout the ducts ; but even in instances where they have been found after death to be the most numerous, no signs of inconvenience have been recognized during life. Improved acquaintance with the anatomy and physiology, coupled with opportunities for closer observation by scientific men, must eventually develop truths that are now hidden, misinterpreted, or unintelligible.—*Ed.*]

THE YELLOWS OR JAUNDICE.

This is a common disease among neat cattle, and proceeds from the obstruction of the gall-bladder and the cystic duct. The gall is a yellow liquor, separated in the liver, and collected in the gall-bladder ; its great use is to mix with the chyle, to rouse the peristaltic motion of the intestines, and to finish digestion. This saponaceous juice corrects the acidity in the stomach and bowels : its salutary effects are powerfully felt in all parts of the body.

The yellows or jaundice consists in a diffusion of this bile throughout the whole body, and is favoured by everything that obstructs its passage into the *duodenum*. This disease is first observed in the white of the eyes, which appears of a

yellow tint, and as it increases the whole skin becomes impregnated with the same yellow hue ; the ears, tail, eyes, and mouth are the parts where it is most conspicuous to the sight. In every stage of the disease the animals are attended with weakness and a great debility of the nervous system, a listlessness to move, and want of appetite. When in the pasture, they wander about by themselves, by the side of hedges or fences, in a dejected manner.

These appearances sufficiently indicate the disease. Milch cows are the most subject to it in the spring and the latter end of the year, although they are not exempt from it at all other times. The most dangerous state in this disease is when a scirrhus liver is the cause ; little hope can then be entertained of a permanent cure. The fluctuating state of the weather has a powerful effect upon the animal frame in retarding or promoting a cure. Care should also be taken to house them at all unfavourable opportunities [qy., seasons ?]

[Jaundice is usually viewed as an indication of *all* affections of the liver, particularly those of the most acute kind. It is doubtful, however, if such a conclusion can be accepted with truthfulness and decision, as will be more apparent shortly.

Nature.—The term jaundice is applied to that state in which the visible mucous membranes, skin, &c., assume a yellow colour, as a result of the absorption of the secretion of the liver (bile) into the blood, and deposited throughout the system. It is mostly to be regarded as a symptom of other diseases which produce a mechanical or other impediment to the flow of bile into the intestines, all disorders of the digestive organs ministering greatly to the condition. As an idiopathic or distinct disease, jaundice sometimes occurs, but in comparative rarity to the symptomatic form. As such we shall consider it.

Symptoms.—The first and most remarkable is the intense yellow colour of all visible parts of the body and the mucous

350 *Diseases of the Digestive Organs.*

membranes. The skin, in well-marked cases, and particularly those having existed some time, freely partakes of the colour. The digestive organs are evidently under severe disorder, as indicated by irregular bowels, tympanitis of a frequent but far from acute character, discharge of flatus from the rectum, constipation, dry, hard, dark-coloured, deficient *foeces* covered with mucous. The urine is deeply coloured, owing to the colouring matter of the bile being discharged by it; its odour is offensive, and paper saturated by it, and afterwards dried, is permanently stained. The appetite is capricious, but generally absent; rumination is suspended, the mouth is clammy or slimy, the tongue being thickly coated. The pulse is usually not much affected or is slower than natural.

Such cases unrelieved are liable to degenerate into aggravated forms. The pulse becomes very slow and infrequent; the temperature of the horns, ears, extremities, and body generally is very low, being cold as clay to the hand. Dropsical states of the limbs are seen, anæmia is developed, wasting and prostration proceed rapidly, and death follows at various periods, sometimes as far as twelve weeks from the commencement of the symptoms.

Post mortem Appearances.—Bloodless state of the whole body, muscles pale and flaccid, bowels constipated, first and third stomach contains ingesta (food), but not in large quantity, gall-ducts of the liver thickened, substance of liver probably in parts also scirrhus; abscess, gall-stones, hydatids, and other parasites, tumours, tubercular deposits, &c., may be present.

Treatment.—The disease in the early stages should be met by saline purgatives after the form subjoined.

RECIPE NO. 108.

Take of sulphate of soda	12 to 16 oz.
Gentian, powdered	2 „
Extract of tarraxacum	4 drs.
Calomel	30 grs. to 1 „

Mix, and administer with warm ale and treacle. The skin should be called into action by friction immediately after cold ablutions, or the Roman bath where possible.

At the end of twenty-four hours, either of the following formulæ may be employed :

RECIPE NO. 109.

Take of chloride of potassium	1 oz.
Calomel	$\frac{1}{2}$ dr.
Powdered opium	10 grs.

To be given in a pint of gruel morning and evening. Or,

RECIPE NO. 110.

Take of iodide of potassium	2 drs
Extract of tarraxacum	2 „

Rub the extract with half an ounce of ginger to a dry powder, and mix with the iodide of potassium ; to the whole add half a pint of gruel, and repeat the dose morning and evening during four or five days.

Occasional clysters should be given if the bowels become constipated during the employment of the preceding. The following is occasionally used :

RECIPE NO. 111.

Take of sulphate of soda	4 oz.
Nitre (saltpetre)	$\frac{1}{2}$ „
Powdered gentian	1 „

Mix, and give every morning for a week or ten days ; but if purgation ensues, a day or two must be allowed to elapse before the mixture is again administered.

When such cases become convalescent, great care in feeding must be observed ; the food should be nutritious, plain, and easily digested. Linseed gruel or tea throughout is valuable. Roots, clover, &c., in small and repeated quantities, boiled barley, malt mash, pickings of sweet hay, &c., form the requirements, with cleanliness, and all other domestic comforts.—*Ed.*]

CONGESTION OF THE LIVER (*Hyperæmia*).

[As a result of a stimulative plan of feeding, little or no exercise, heated buildings, &c., conducing towards a languid circulation, the liver is apt to suffer from a fulness of blood, known in medical language under the above names. In most cases the state is not observed. The animal, in a state of plethora, exhibits signs of constipation, a little dulness, and even jaundice; but if the appetite is not lost, such attract no attention until they assume more aggravated conditions, and betoken the states already given in the last chapter, or those about to follow.

Repeated congestion induces thickening or induration of the gland or its ducts, and by disorder of secretion, the formation of gall-stones, &c.—*Ed.*]

INFLAMMATION OF THE LIVER (*Hepatitis*).

[This affection results from congestion of the gland.

Symptoms.—Acute febrile symptoms are observed as soon as the organ becomes inflamed, but jaundice may not be present. This symptom does not characterize the inflammatory stages when the attack has commenced without previous signs of indisposition. The stage of congestion is short, and secretion of bile is arrested in the subsequent one of inflammation. Pressure on the right side, immediately behind the last rib, is productive of pain: the animal moans or grunts on its infliction, and shrinks from the blows in percussion. The pulse becomes very slow and infrequent, the horns, ears, and extremities are icy cold, respiration is slow and even abdominal, the membranes are ashy pale, bowels constipated, dung hard, dry, and black, but glazy, giving to paper a greasy yellowish-green stain; the urine is also deeply coloured, the milk is yellow, deficient, and sometimes possesses an unpleasant

odour; skin harsh and dry, coat staring. Sometimes colic appears, and the animal staggers and faints. Complications now occur: the peritoneum may inflame and hasten the death of the creature, or dropsy of the abdomen ensues, the animal assuming a pot-bellied appearance, and eventually dies after great emaciation.

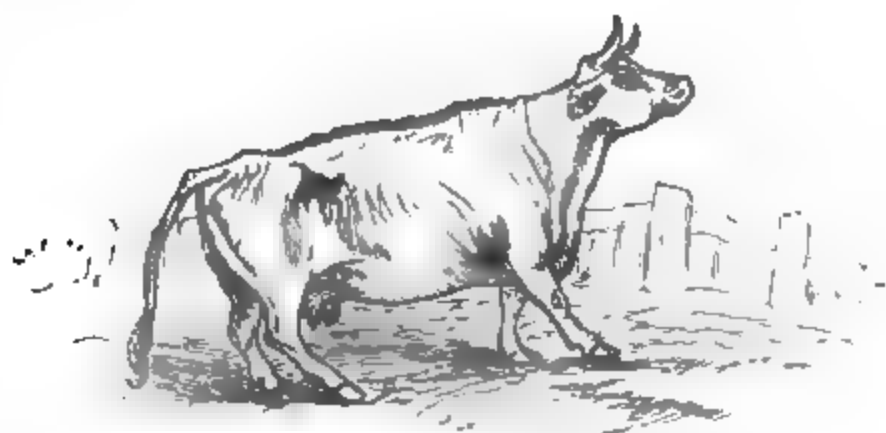


Fig. 124.—*The Fainting-fit.*

Post mortem Appearances.—In those cases not characterized by dropsy, the liver is heavy, softened, and sometimes greatly enlarged, doubtless from previous attacks of congestion. Hypertrophy of tissue (scirrhus) or abscess is present, and adhesions to contiguous organs.

Treatment.—Bleeding is decidedly hurtful for inflammation of the liver. Powerful blisters should be placed over the right side, and purgatives and clysters should be given. Subsequent treatment corresponds with that detailed for jaundice, which should be scrupulously carried out.—*Ed.*]

SECTION V.
DISEASES OF THE URINARY
ORGANS.

DISEASES OF THE URINARY ORGANS.

[Next to affections of the digestive organs, those of the urinary apparatus may be taken as an example of an important and interesting class. They are closely allied, and it becomes a question for serious consideration whether certain diseases dependent upon functional derangement of these organs should not be viewed as belonging to, and even classed among, the disorders of the digestive track, seeing that the cause is undoubtedly concentrated in the process of digestion or assimilation.

The kidneys, which form the principal organs of the urinary system, are unlike many others of the body. They are not engaged in the formation or elaboration of any fluid or material which plays some important part in the building up of the body, but, on the contrary, exclusively employed in the separation of compounds from the blood, which, if retained, would prove highly injurious. Their office is purely one of secernation—purifying and separating the deleterious and worn-out portions of the body from the blood.

The constitution of urine in health is one of the subjects that afford to the pathologist great assistance in his estimate of disease or disorder of the urinary organs. When the functions of digestion and assimilation are actively and properly performed, the urine exhibits a tolerably uniform condition of

colour and constitution; but as soon as the stomach and intestines allow of the passage of compounds unsuited to the blood or building up of the body, the office of the kidneys to separate and throw, or eliminate them, is called into requisition. In this way the urine contains foreign or unnatural ingredients; and if their manufacture by the stomach should prove constant, and the kidneys are called upon to engage as regularly in their separation, those organs may be unduly exerted, and disorder or disease is the result. In this way substances, which, under proper conditions, are soluble in the blood, enter into union with unlike bodies, and, by chemical action, assume conditions of insolubility. The kidneys, or bladder, thus become charged with sabulous or sandy-looking matter, portions of which are voided in urination. In other animals these small particles aggregate or collect into a solid hard mass, known as a calculus, the presence of which in the bladder, kidney, or urethra, &c., may cause not only awkward symptoms, but even death.

The *density* of the urine is a means by which its nature and constitution are arrived at. By density we mean relative weight; thus, a given measure of water, we will suppose, weighs thirty grains, while another fluid taken in exactly the same quantity would weigh thirty-five grains. The density of fluids and solids is known also as *specific gravity*, and as such is spoken of generally when investigating the nature of the urine. The comparison of the fluid is made with water, as the standard of fluids, and for the purpose a graduated and very delicate as well as fragile instrument of glass, called the urinometer or urogravimeter, is taken, such as is given in the engraving. It consists of two bulbs and a stem. In the lower bulb a counterpoise of quicksilver is placed, in order that the vertical position may be preserved when in use. Inside the stem is a scale, graduated from 0 to 60, and by this the exact density of fluids heavier than water is ascertained. If the instrument

is plunged into water, it will sink to 0 on the scale, a point which is understood to mean 10·00; but when put into wine does not sink so low, therefore a different reading of the scale is observed. Thus, if the top of the fluid is level with the figure 10 on the scale, we should say the density of the urine is 10·10; if it is in a line with 25, then the density would be 10·25, and so on.

The *temperature* of the urine has a tendency to influence the readings of the urogravimeter; the practitioner, therefore, takes care to secure that the fluid to be examined has an uniform heat—that of 60° of Fahrenheit's thermometer being the most proper.

The *constitution* of urine has been said to alter in accordance with the function of digestion; it will, therefore, be understood, that in ordinary conditions the secretion will vary in different animals. Food possesses different properties, and when animals, as carnivora and herbivora, subsist entirely upon one variety, the function of digestion is not only an act specially applied to the variety of food, but the organs also are special, and the secretion of urine, therefore, partakes of special characters. The urine of cattle and sheep in health is alkaline, that of the dog and man is acid; such characters being the result of the changes of food within the system.

These are known as the *reactions* of urine, and are generally detected by the use of coloured papers, which, when saturated by the fluid, alter to another colour or different shade, in accordance with the intensity of the action. Two kinds of paper, specially prepared, are in use; one, litmus or *blue*, which on

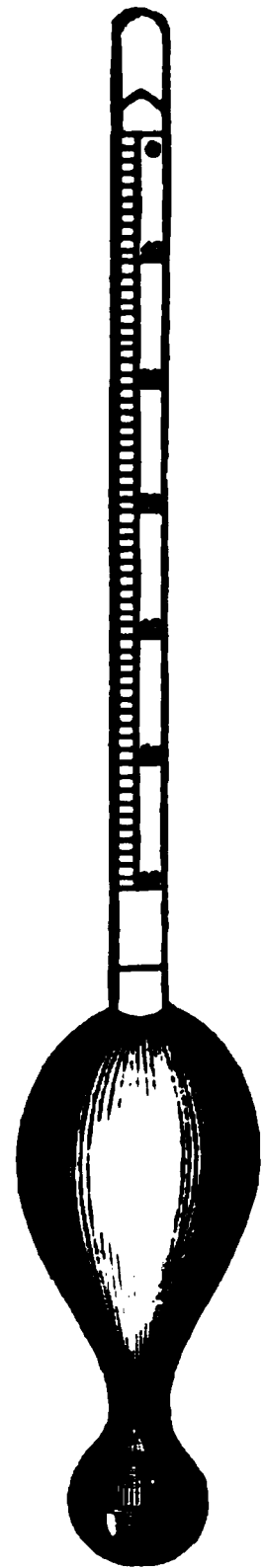


FIG. 125.—The Urinometer or Urogravimeter.

360 *Diseases of the Urinary Organs.*

being dipped in acid urine instantly becomes *red*, but is unaffected by alkaline urine. The second, *yellow*, is changed to a *brown* by alkaline urine, but unaffected by an acid fluid.* These reactions, then, betoken chemical changes or natural conditions of importance, and the urogravimeter points out the density, two important decisions in abnormal urine.

In health the specific gravity of the urine of the animals here considered is about as follows:

Cattle.....	10'30 to 10'40
Sheep.....	10'20 „ 10'30
Pigs	10'10 „ 10'12

Urine constantly exhibiting a density above or below these registrations is said to be morbid. When the density is great, it contains an excess of substances which are foreign to a state of health; and when it is below the standard the quantity of water is increased. Such changes, however, may be observed as a temporary effect of diet, &c., without being in themselves positive signs of disease.

An increase of water in the urine may arise from some cause of irritation resident in the kidneys, but previously derived from the food; certain salts, as nitre, and plants in herbage, are also frequently productive of a profuse watery secretion.

Among the constituents which increase the density of the urine are certain compounds derived from the system, consisting of salts and other organic products. In the healthy urine of the cow the proportion of water in 1,000 parts is found to be about 920 parts, and of solid constituents 75 to 88 parts. More minutely, the analysis is as follows:

	1.		2.
Water	912'01	.....	923'11
Solid constituents	87'99	.....	76'89
	<hr/>		<hr/>

* Mr. L. Cassella, 23 Hatton Garden, London, has supplied me with a very suitable case, containing urinometer, thermometer, test-papers, &c., &c.

Diseases of the Urinary Organs. 361

	I.		2.
Urea	19·76	.....	10·21
Hippuric acid.....	5·55	.....	12·00
Mucous	0·07	.....	0·06
Alcoholic extract	14·21	.....	10·20
Watery „	22·48	.....	16·43
Soluble salts	24·42	.....	25·77
Insoluble „	1·50	.....	2·22

We have said the density of the urine is liable to increase in disease, or as a result of some alteration in diet. Such a change is decided by a greater quantity of the solid constituents named in the analysis, as urea, soluble and insoluble salts, &c. The practitioner, when called to minister to the diseases of animals, derives much information by inquiries into the nature of the urinary secretion. Scanty urine is mostly of a deep colour, in consequence of its holding more salts and colouring matter in solution. The water here is deficient, but the solid constituents may not be increased if the urine voided during twenty-four hours is estimated. Acute diseases, inflammation of important organs, &c., limit the quantity of the urinary secretion, by diverting the blood in another direction from the kidneys.

The presence of other compounds also gives rise to peculiar characters of the urine, and from these important facts are gleaned. The colour may be considerably deepened by the presence of blood in various forms. A degree of viscosity may be conferred by a quantity of albumen, or rapid decomposition occurs in consequence of an abnormal quantity of urea ; the bladder may secrete pus, mucous, &c., in large quantities, and thus facilitate decomposition as well as aggravate disease. Various plants confer colour and odour ; the colouring matter of the bile finds its way into the urine, and stains paper of a yellow colour when dipped into it. Many medicines are voided by the kidneys, even some of the most insoluble kinds, as mercury, arsenic, &c., and may be detected in it. Soluble salts are readily passed by them.

362 *Diseases of the Urinary Organs.*

The foregoing outline of the nature of the urine, although brief, will at least afford assistance in arriving at one conclusion, viz., that the functions of the kidneys bear a close relation to digestion, and prepare a way to the fact that, under changes going on in the stomach, blood, &c., disorder of the kidneys is not an uncommon occurrence.

The affections of the urinary organs may be divided under two heads, viz.: I. *Functional disorders*, and II. *Structural diseases*.

I.—FUNCTIONAL DISORDERS.

These are purely dependent upon causes of remote origin, and consist only of a morbid action of the urinary organs in ordinary cases, but by long continuance, aggravation of causes, &c., may degenerate into chronic conditions, as well as structural alterations, and even incurable states. We notice first

PROFUSE URINATION OR DIABETES.

This affection is variously known as *diuresis*, *polyuria*, *diabetes insipidus*, *profuse staling*, &c. As a rule, it may be observed as an effect of indigestion entirely, but complicated forms are not unfrequent, and associated with organic diseases of a protracted and debilitating character.

Causes.—Inferior food, the produce of wet and adverse seasons. Cattle and sheep, &c., after “pulling through” a hard winter, and afterwards supplied with large quantities of green food, roots, &c., sometimes suffer acutely from this affection; but more commonly it arises as a result of a continued deficiency of good food in summer, which leaves them no alternative but to take all kinds of rank herbage, and not unfrequently irritant plants. These either disturb digestion or act as direct irritants to the kidneys.

Symptoms.—A copious discharge of urine, which forms a

great contrast to the healthy secretion by being clear and transparent, having only the density of water, contains no earthy carbonates, and frequently possesses an odour resembling peppermint or acetic acid.

The appetite is ravenous, and with apparent relish the animal licks the walls and partakes of the most opposite articles as food, as dirt and even filth, litter, &c. ; the bowels are irregular, tympanitis present, mucous membranes pale, mouth cold, tongue slimy or furred, breath somewhat foetid, temperature of body low, thirst excessive (*polydipsia*), staring coat, rapid emaciation, anæmia, exhaustion, and even death. Sometimes the copious discharge of urine ceases, but other signs remain, the disease assumes chronic characters, tuberculous states may arise and terminate the animal's existence months afterwards.

Acute cases continue for a period of a few days, but occasionally remain unrelieved throughout long periods.

Post mortem Appearances.—The whole body appears pale, bloodless, and flabby. This is particularly evident in the muscles, liver, and kidneys.

Treatment.—Without a change of diet, medicines will often effect positive harm. In the early stages of the disorder the tone of the digestive organs must be restored, and the primary attempt is to be made by the administration of a laxative with such combinations as follow :

RECIPE NO. 112.

Take of Epsom salts	8 to 12 oz.
Extract of tarraxacum	$\frac{1}{2}$ "
Gentian.....	1 "
Ginger	1 "

Mix the three last ingredients in a mortar and rub them to a powder ; afterwards mix with the salts, and administer in warm ale with treacle.

The morbid thirst is to be allayed by the exhibition of the following every twenty-four hours. Care must be observed

364 *Diseases of the Urinary Organs.*

that the dose is given early in the day and before the animal has taken food.

RECIPE NO. 113.

Take of pure iodine	1½ drs.
Iodide of potassium	2 „
Infusion of quassia	1 pt.

Sheep will require about one-sixth part. Many remedies in addition to these have been found useful, as creosote, cantharides, iron and soda, magnesia, potash, opium, catechu, &c., &c.; but usually the disease gives way at the outset under the remedies named before.—*Ed.*]

OBSTRUCTIONS TO THE FLOW OF URINE.

[Various technical terms are applied to the forms of an obstructed discharge of urine. When the secretion and flow are suppressed it is termed *ischury*; a limited discharge attended with painful attempts is known as *dysury*; and, lastly, when but a few drops can be passed the condition is known as *strangury*. Such states are recognized as signs of importance that indicate the existence of even serious disorder, which in many instances become very urgent. Examples of the various states will afford greater information on these heads.

In nephritis and other diseases the secretion of urine is arrested by the progress of disease obstructing secretion generally; the fluid then becomes acrid and produces irritation upon the membrane of the bladder, &c., which causes it to be discharged in small quantities, or even limited to a very few drops. The effects of certain medicines, as cantharides and strong diuretics, given by the mouth or absorbed through the skin, may not only cause an increased secretion of urine, but also limit the flow by the production of spasm of the muscle at its outlet. The presence of a stone (calculus) in the bladder, or urethra, its canal, may also induce similar symptoms; and want of muscular tone in the bladder, by resembling some of these

conditions, or false treatment suggested by the absence of knowledge of the nature of the parts, may end fatally.

The causes are frequently remote, and it should be the duty of all who wait upon animals to afford every information calculated to throw light upon them. The practitioner values many simple facts as important, and none of these are to be withheld on account of any apparent insignificance. Various states of disease of the organs of urination, leading to the conditions referred to, will now be discussed.—*Ed.*]

RETENTION OF URINE.

[The affection known under this head consists of an accumulation of urine within the bladder without any means of discharge. The functions of the kidneys are properly performed, but they may also be excited to an over-secretion, and thus increase the malady.

The *Causes* are various, and may be enumerated as follows : Medicines whose effects are exerted upon the kidneys, stimulating them to increased secretion, and upon the neck of the bladder, effectually closing its outlet for the discharge ; inflammation of the neck of the bladder, or at any other part of the urethra, which also closes the passage ; paralysis of the bladder itself ; calculi blocking up the canal ; inversion of the rectum, or presence of large quantities of fœces within it ; and in cows, sheep, &c., it occurs during an inability to rise, inversion of the vagina, or pressure of the contents of the abdomen upon the opening.

Retention of urine is seen in males more commonly than females. This is due to the arrangements of the discharging apparatus. The affection, like the forms just described, is frequently a symptom of other states, and an aggravated condition of milder diseases. Under all states it is urgent, and requires immediate attention. During its continuance, the

366 *Diseases of the Urinary Organs.*

bladder is endangered from probable rupture, or the animal may suffer death by a state known as "uræmia,"—already noticed at page 56.

Symptoms.—Retention of urine is denoted by repeated but abortive attempts to urinate. The animal is uneasy; he lies down and rises frequently; the hind legs are alternately raised, and the position shifted from side to side. The expression of the countenance is that of pain and anxiety, and the nose is frequently turned to the flank; the pulse is accelerated but generally wiry; and as the disease proceeds the coat becomes rough, and the wasting of flesh is rapid in a short time.

Treatment.—The urine must be removed by artificial means if other remedies fail. The latter consist of warm water injections to remove fœces from the rectum; strong solutions of opium, belladonna, or hyoscyamus injected into the rectum to allay spasm at the neck of the bladder, or injections beneath the skin, are of service. The artificial mode of removing the urine is effected by using a tube, which is passed into the bladder.

The catheter is a hollow tube of German silver about thirteen inches long, slightly curved, bulbous and closed at one extremity, and about five-sixteenths of an inch in diameter (Fig. 126). It is perforated at the sides of the shut end for the egress



FIG. 126.—*Catheter for removing the Urine.*

of urine. Although known as the female catheter, it is frequently called into service for the male of cattle, and a smaller one is used for rams and pigs.

When retention of urine occurs, this instrument passed along the floor of the vagina in females, preceded by the index finger

of the left hand, enters the opening to the bladder with little trouble, and urine, when present, flows readily away. This precaution should be observed always among cattle that are unable to rise from any cause, as accumulation of urine is common, and by pressure prevented from being discharged.

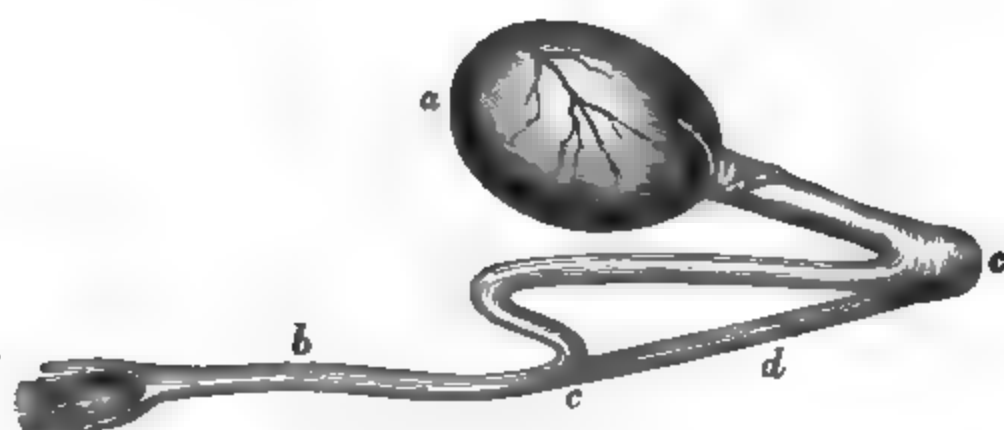


FIG. 127.—*Urethral Canal of the Ox.*

a. Bladder of the Ox.
b. Urethral Canal.

c. Curves of the Urethral Canal.
d. Retractor Muscle of the Penis.

In male animals generally, the operation is rendered difficult by anatomical peculiarities which occur; but in the ox even states of a more complex nature exist from a number of curves in the urethral canal, as shown in Fig. 127. It is impossible to pass a tube through the urethra in him from that cause, and the practitioner resorts to an operation in which the canal is opened at its first curve over the pelvic bones. The female catheter is then used—a direct passage to the bladder being established, as shown in the annexed engraving (Fig. 128)—and the discharge of urine at once effected.—*Ed.*]

INCONTINENCE OF URINE.

[This disease, usually known as *enurésis* in medical language, consists of an inability to retain the urine within the bladder, which may arise from two causes. One, frequently very troublesome, occurs from a paralysis of the coats of the bladder; and the second, from a non-closure of the aperture at the navel,

368 *Diseases of the Urinary Organs.*

communicating with a tube called the *urachus*, which carried the urine from the bladder before birth. The latter occurs only in young animals.

Treatment.—In paralysis of the bladder, if calculi are present, they must be removed by operation; but when it results from other causes—as cold, or associated with paralysis of other parts of the body—attention must be given towards a removal or mitigation of each.

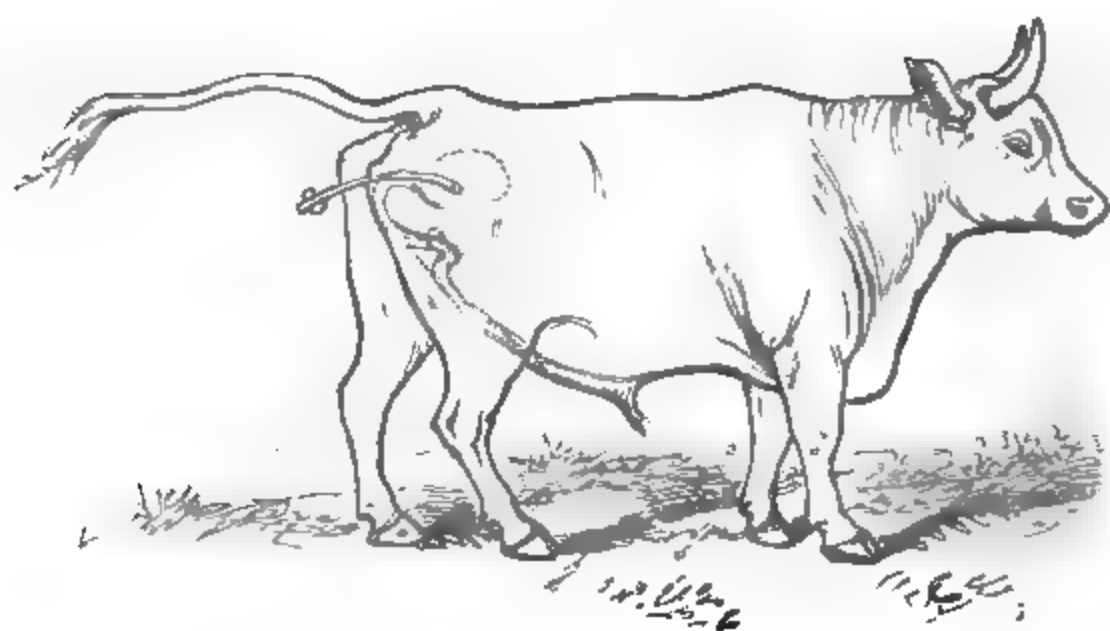


FIG. 128.—Operation for removing Urine from the Ox.

A want of tone in the bladder is frequently observed in emaciated animals, or those debilitated from exposure and diseases generally, bad food, &c., inducing indigestion. In such cases, the exhibition of a laxative is attended with much benefit, followed by the use of daily doses of cantharides, nuxvomica, strychnine, &c., with gentian, quassia, colombo, &c. Galvanism is sometimes attended with great success.

In the form described as occurring in young animals, the opening at the navel should be secured by a proper ligature, after the insertions of sutures of silver wire, &c. Dressings of nitrate of silver, the sulphates of copper, zinc, burnt alum, &c., sometimes effect a closure.—*Ed.*]

ALBUMINOUS URINE—ALBUMINURIA.

[This is an affection that has frequently been unobserved. Technically it is known as Bright's Disease, albuminous nephritis, &c. Among earlier investigators it was considered an inflammatory affection—hence the term "nephritis" which was given to it. It is now, however, decided that albuminuria among the lower animals is not only more common than hitherto believed, but also that it is not essentially a disease of the kidneys, being primarily the result of a disordered diges-

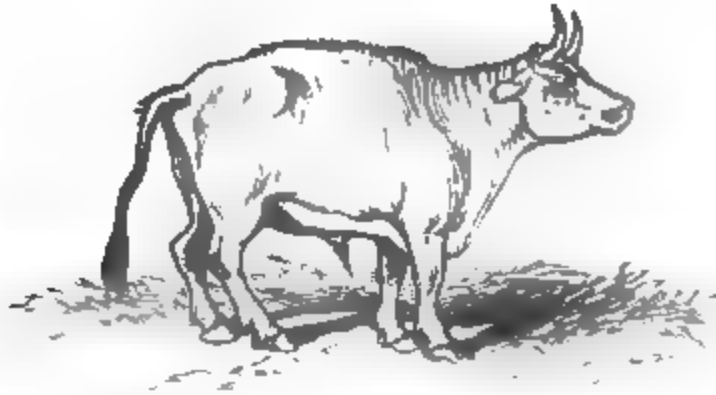


FIG. 129.—*Traumatic Albuminuria.*

tion, in which a low form of albumen is formed, and being inadequate to the wants of the body, is discharged from the blood by the kidneys. It is a disease which is the result of irregular feeding and bad management, and any cause that can be included under those heads may be said to give rise to albuminuria. It therefore exists as a sign of other affections—a disordered digestion and lesions of the brain and spinal cord as a result of injury or cold being the most common. Male animals and those not giving milk are mostly affected.

Symptoms.—When an injury has been inflicted, the animal may be found standing with the back arched upwards (Fig. 129), feet drawn together, and in those cases where the history furnishes no evidence of such, the back is then arched downwards or perfectly straight, and there exists a great desire to

370 *Diseases of the Urinary Organs.*

stretch at full length (Fig. 130). Constipation is evident ; the animal is stiff—moves with pain and difficulty, and as little as possible, with legs wide apart. The pulse is not much affected, but the respiration is generally increased.

The urine is thick, mucilaginous, and dark-coloured ; and with the tests for albumen, certain differences are found that may mislead the inquirer. It must be remembered, the albumen here found is often of a very low form of organization, and behaves rather differently with the ordinary tests. Heat frequently fails to coagulate it ; strong mineral acids produce

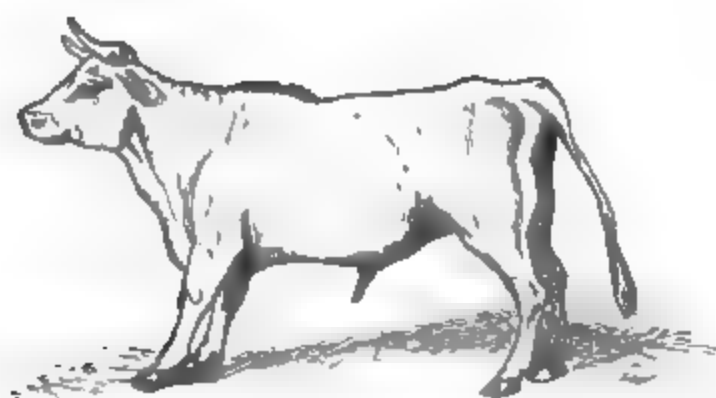


FIG. 130.—*Idiopathic Albuminuria.*

a clear thin fluid ; but white precipitates are obtained with nearly all the following : tincture of galls, solution of bichloride of mercury, alcohol ; solution of subnitrate of mercury, flesh-colour ; solution of ferro-cyanide of potassium, acidulated with acetic acid, gives a white precipitate after being heated. "

The attack is usually acute, and when no relief is gained the animal drops paralysed, congestion of the lungs ensues, and death takes place from coma as a result of blood poisoning.

Treatment.—If there is any stranguary or inability to discharge the contents of the bladder naturally, the urethra must be opened, and the female catheter inserted, as already described at page 367. A brisk purgative should at once be administered to carry off the undigested as well as indigestible

contents of the stomach and intestines, and correct their tone. For an ox, the following dose may be given ; or to sheep and pigs one-sixth or one-eighth part—large quantities of fluid being added :

RECIPE NO. 114.

Take of Epsom salts..... 16 to 24 oz.
Gentian and ginger, of each .. 1 „
Nux vomica 2 drs.
Warm ale and treacle, sufficient.

Mix.

Clysters should be perseveringly adopted at regular intervals until the constipation is overcome.

If the discharge of albumen continues, or the presence of blood material is detected, it may be required to administer mineral acids, vegetable astringents, &c. The following formulæ may be variously employed :

RECIPE NO. 115.

Take of sulphuric acid 2 drs.
Tincture of cardamoms 1 oz.
Water 1 qt.

RECIPE NO. 116.

Take of powdered catechu or kino 4 drs.
„ opium 1 „
Essence of ginger $\frac{1}{2}$ oz.

Mix, and give in warm ale or gruel.

RECIPE NO. 117.

Take of tannic acid 1 to 2 drs.
Opium 1 „
Essence of ginger $\frac{1}{2}$ oz.

Mix, and give in ale or gruel.

Great attention is required in the selection of diet. It should consist of good and easily-digested food, all irregularities being avoided as much as possible.—*Ed.*]

II.—STRUCTURAL CHANGES INVOLVING DISEASE OF THE URINARY ORGANS.

HÆMATURIA—BLOODY URINE.

[WE propose to consider here two forms of hæmaturia or bloody urine: one, in which the causes are easily made out and known by the term *traumatic hæmaturia* among veterinary pathologists; and the second, in which causes are not unfrequently obscure or of a multiplied character, called the *idiopathic* variety. Under the latter term is included two other forms: one already described under “Functional Disorders”—the *asthenic* or debilitating kind; and the *sthenic* or active kind. These distinctions are essential as leading to a correct mode of treatment: without them it is more liable to become false than curative. A desire to dabble in medicine, unaccompanied by a knowledge of disease, leads to officiousness and improper selection of remedies; and it may be instructive to many to be informed that, under such treatment, medicines have the power of killing—a result commonly effected.

TRAUMATIC* HÆMATURIA.

This form of bloody urine is common to all breeds of cattle, sheep, and pigs, as a result of injury inflicted upon the structures in the neighbourhood of the kidneys. When animals have been thrown into ditches, or over banks, rocks, &c., red water frequently occurs. Cattle are apt to leap upon each other and thus injure the back; they also incur serious injury in running violently through doorways in numbers, or below fixed objects that are too low for them to pass upright: draught oxen suffer after heavy ploughing and drawing of

* Signifying “a wound,” or “produced by a wound or injury.”

weighty loads in carts. The presence of calculi (stones) also is a common cause. It happens but rarely that more than one animal in a number is affected by this disease.

Symptoms.—Traumatic hæmaturia is always accompanied by a great amount of symptomatic fever. The pain in the loins is intense, and easily demonstrated by pressure on the spine. If the creature can stand, the back is arched upwards (Fig. 131), the tail is held outwards, and the attempts to urinate

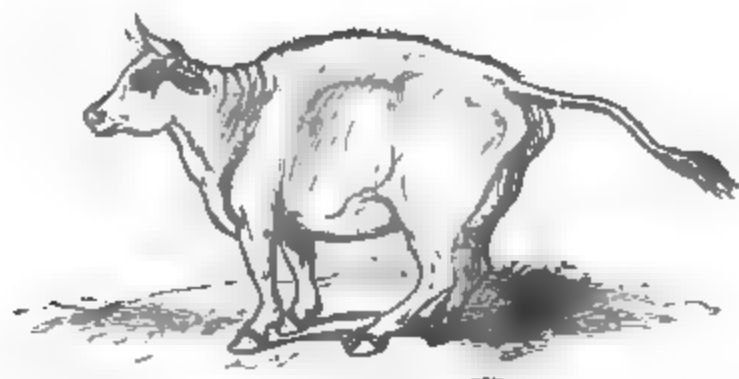


FIG. 131.—*Traumatic Hæmaturia.*

are frequent, but the discharge is small. He is stiff, and, when caused to move, walks with legs wide apart: in the house he stands persistently, being averse to the pain incurred in lying down and rising. In other cases paralysis is present even in the early stages, and may continue until death takes place. The attack is sudden, and all the signs are very acute; the pulse is rapid and wiry, appetite and rumination absent, and in milk cows the lacteal secretion is also arrested; the mouth is hot, muzzle dry, horns hot at the roots, ears and extremities warmer than natural, and general temperature increased; bowels constipated, discharge of urine sometimes totally arrested by pressure derived from the position, but is restored if the animal is assisted to rise.

The distinguishing sign of this affection, as afforded by the secretion, consists in the passage of blood with it, which not uncommonly separates after it has fallen or is discharged in unmistakable clots. The urine is, therefore, not possessed

374. *Diseases of the Urinary Organs.*

of an uniform red colour, as would be the case when blood is diffused through it. The disease is apt to recur.

Treatment.—The animal must be separated from all companions, and kept as quiet as possible. The rectum is to be unloaded quickly by injections of *cold* water, which should be continually applied at intervals of fifteen minutes. Sometimes cold water or wet cloths over the loins are of service. Purgations are not always advisable for several reasons. The vessels are already too much relaxed; irritation of the bowels by medicines of a cathartic character is apt to aggravate the condition of the kidneys; and, in addition, in their excited state, those medicines are more liable to pass off by them rather than fulfil the mission for which they were originally intended.

If stranguary is present the catheter must be used, as described at page 367, and the following forms of astringent mixtures used as circumstances arise:

RECIPE NO. 118.

Take of powdered nut-galls	4 drs.
Infusion of quassia	$\frac{1}{2}$ pt.

Mix.

RECIPE NO. 119.

Take of solution of perchloride of iron	1 dr.
Infusion of quassia	$\frac{1}{2}$ pt.

Mix.

RECIPE NO. 120.

Take of powdered nut-galls	2 drs.
„ opium	1 „
Water or gruel	1 pt.

Mix.

RECIPE NO. 121.

Take of powdered nut-galls	2 drs.
„ catechu	2 „
„ opium	1 „
Water or gruel	1 pt.

Mix.

Sthenic or Idiopathic Hæmaturia. 375

RECIPE NO. 122.

Take of sulphate of zinc	1 dr.
Acetate of lead	$\frac{1}{2}$ „
Powdered catechu	4 „
Infusion of quassia	1 pt.

Mix.

One of these formulæ may be taken and repeated during several days, or alternated with one another if necessary.

During the continuance of the symptoms the diet must be light, and it may be necessary to restrict the use of water. Linseed-tea is a valuable substitute in small quantities. When the symptomatic fever runs high, it may require special treatment in the form of febrifuge medicines; and under circumstances of this kind, aconite may be added to some of the formulæ of vegetable astringents just given. The greatest circumspection is required in order to avoid an over-dose of the medicine, or to withdraw it as soon as the desired effect is produced.—*Ed.*]

STHENIC OR IDIOPATHIC HÆMATURIA.

[This form of hæmaturia frequently arises in a district, and assumes the character of an enzoötic, attacking cattle, sheep, and even pigs when at large. Its widespread prevalence is at once understood to have a totally different origin than local causes. The animals of one farm are not alone affected, but often those of a number of farms throughout a whole district.

Causes.—Peculiarity of season has much to do with the production of this form of disease. During continued hot weather, in spring or autumn, when pastures are deficient in ordinary food and water scarce, the animals consume other plants, which being of an acrid character, and possessing specific effects upon the kidneys, develop the form of disease we are considering. In the experience of the writer cases have occurred from the consumption of large quantities of the *Mercurius perennis* or common herb mercury.

376 *Diseases of the Urinary Organs.*

Nature.—An active congestion or overloaded state of the blood-vessels in the kidneys, which admits of a passage of blood with the urine. Inflammation of those organs is not an uncommon occurrence from the causes named.

Symptoms.—These very much resemble the signs of traumatic hæmaturia (Fig. 132). There are, however, certain modifications. The appearance of febrile signs is a usual accompaniment, but are developed more slowly. By degrees there is suspended appetite, rumination, milk, &c.; the mouth becomes hot, ears and extremities cold, muzzle dry, pulse at

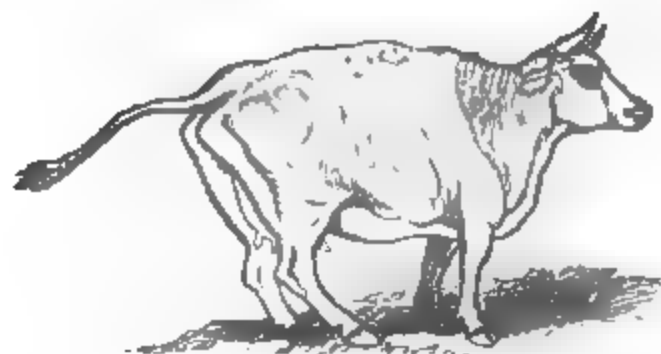


FIG. 132.—*Sthenic Hamaturia.*

first tolerably full, but shortly becomes wiry and rapid. The coat stares, and a stiffness is observed in movement, which gradually increases, together with great tenderness over the loins. Ordinary cases may continue two or three weeks, but in others—in which the symptomatic fever runs high—acute nephritis or inflammation of the kidneys supervenes, and the animal may die much sooner. Another termination is occasionally met with in which paralysis occurs and abscesses have formed within the kidneys.

The urine in this disease—the characters of which form one of the specific signs—is at first deficient in quantity and discharged with pain and difficulty. Its acrid nature produces more or less irritation of the bladder, and even spasm at the neck. The colour is deep but transparent, and gradually assumes an opaque orange-red tinge, and with chemical reagents

Sthenic or Idiopathic Hæmaturia. 377

exhibits those reactions which denote the presence of albumen, &c. The blood material is equally diffused through the urine, and by the microscope degenerated blood globules and epithelial scales are detected.

Treatment.—When a number of animals are simultaneously affected in conjunction with peculiarity of season, the natural conclusion will be apparent that a widespread cause is prevailing; and the quality of food then being most questionable, the cause may be naturally suggested to lie in that direction. Animals should at once be removed from those pastures, and if others possessing better herbage are not at hand, provision should be made for a supply of a mixture of grain with artificial food—hay, bran, &c., &c. Each affected animal should receive at once a drench compounded somewhat as follows:

RECIPE NO. 123.

Take of Epsom salts	16 to 24 oz.
Sulphur	2 „ 4 „
Calomel.....	1 dr.
Croton oil.....	10 to 20 drops.
Ginger and gentian.....	1 oz.

Mix, and administer in one or two quarts of ale and treacle.
 Sheep and pigs, according to size, may receive—

RECIPE NO. 124.

Take of Epsom salts	2 to 4 oz.
Calomel	5 „ 10 grs.
Croton oil	2 „ 5 drops.

Mix, and administer in ale and treacle, half or one pint.

Frequent injections of warm water are necessary, and mustard embrocations over the loins. Linseed-tea forms a good drink, and should be allowed liberally.

The discharge from the kidneys sometimes continues after this treatment has been carried out, when the astringent formulæ—already given at page 374—may be used according to discretion and circumstances. Small and repeated doses of opium and catechu are probably as valuable as any.

378 *Diseases of the Urinary Organs.*

RECIPE NO. 125.

Take of powdered opium	$\frac{1}{2}$ dr.
" catechu	2 "
Infusion of quassia	$\frac{1}{2}$ pt.

Mix, and repeat morning and evening.

When depression follows, as indicated by great weakness, declining pulse, &c., stimulants are called for, in which the preparations of ammonia are particularly valuable.

RECIPE NO. 126.

Take of aromatic spirits of ammonia	1 oz.
Camphor	1 dr.

Mix : add cold ale or porter one pint, and administer every three or four hours, the Recipe No. 125 being also used as directed.

Post mortem Appearances.—In those cases that die, the third stomach and rumen usually contain a tolerable quantity of food : the latter is sometimes constipated, and its leaves are affected by the acrid nature of the plants of which the animal partook during life. The vessels are congested, and their ramifications well marked through their course. Diarrhœa is being established in many cases—particularly those marked by depression.

The kidneys are softened, congested, and their structure unrecognizable. Lymph is found in the pelvis, and sometimes abscesses exist in the substance of the organ. The surrounding tissues also participate to a greater or less extent.—*Ed.*]

NEPHRITIS—INFLAMMATION OF THE KIDNEYS.

[This affection is not unfrequently seen in the cow : the sheep and pig are also liable to it. In giving an outline, we are, in a measure, reiterating the statements that have already been made in the foregoing chapter on "Sthenic Hæmaturia," with, however, certain modifications, additions, or exceptions.

Causes.—The most common are blows and violent strains ; but it also arises from poisonous plants taken as food, and probably one of the most frequent sources are from the absurd system of using repeatedly diuretic medicines, and favourite remedies of that class. It differs from sthenic hæmaturia in the fact that nephritis seldom occurs in a number of animals at the same time, except the whole are placed under similar violent causes. Nephritis also is usually confined to *one* kidney, whereas sthenic hæmaturia not only proves enzoötic, depending upon season, &c., but attacks *both*. The diseases may be further defined by the occurrence that in nephritis the urine contains a greater portion of blood-clots or admixture of blood, and it occurs in male animals as frequently as in females.

Symptoms.—There are usually abdominal pains which occasion great uneasiness. The pain at first manifest in the passage of urine is great, the quantity discharged is small, and having an irritating effect upon the bladder and urinary passages, is ejected forcibly and with continued straining (Fig. 133). The colour is deeper and density greater than natural, albumen is present, and an unusual tenderness is evident in the loins, with stiffness in movement.

Such signs may continue without much alteration or aggravation for a day or two, when the hind legs are held widely apart, and sometimes lameness occurs in one leg. The animal is dull, and the appetite is very much impaired, or, with rumination, absent ; urination becomes more frequent, pain and straining more severe ; blood, and sometimes pus, mingles with the urine ; the horns, ears, and extremities grow cold,

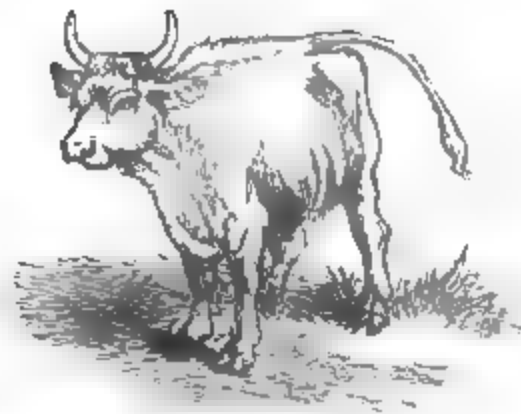


FIG. 133.—*Nephritis.*

380 *Diseases of the Urinary Organs.*

muzzle dry, mouth hot ; pulse frequent and wiry, and breathing accelerated and even laborious.

Signs now become intense. Other organs, as the skin and bowels, are called into action to throw off the deleterious products of waste and decay. Diarrhœa ensues, and even dysentery at times, and the dejections become very offensive ; pain accompanies their expulsion, which, however, subsides as the tendency to discharge from the bowels grows less, which is frequently the case—obstinate constipation succeeding the relaxed state. The skin now takes up the vicarious action, perspiration rolls from the body, chiefly about the back, sides, and shoulders, which has a urinous and offensive odour. The animal moans, and stands with back arched ; the urine is entirely suppressed ; the pulse cannot be felt ; general prostration and coma ensues, and the animal dies generally in three or four days from the appearance of the symptoms. (Sec “*Uræmia*,” page 56.)

Post mortem Appearances.—The inflammatory process is mostly confined to one organ, which is enlarged, and upon its surface a quantity of plastic exudation is found. Internally it is dark coloured and variously marked throughout its substance with streaks or wavy lines and spots of red colour, indicating the congested state of the secreting or cortical part known as the *malphigian tufts*. In some instances only one part of the organ is affected, when it is softened and contains the products of inflammation. Abscess occasionally results from these conditions.

Treatment.—Avoid purgatives, which only tend to aggravate the disorder, on account of their liability to pass off by the kidneys. Some practitioners employ aloes, gamboge, and croton to avoid this untoward occurrence if possible ; but the uncertainty of action in each case prompts their being substituted by regular enemata of warm water. Cold water might suggest itself here as in sthenic hæmaturia ; but it must be

Inflammation of the Kidneys. 381

remembered nephritis is an action more severe in character, and beyond the stage at which cold can be of benefit. Greater good is to be expected by an attempt to restore the circulation, or, at all events, to mitigate pain and suffering by relaxation, which are usually the effects of warm applications.

The next step is to administer such remedies as will reduce the inflammatory action; and, for such a purpose, aconite is an invaluable agent.

RECIPE NO. 127.

Take of solution of the acetate of ammonia	3 or 4 oz.
Fleming's tincture of aconite	30 drops.
Water or linseed-tea	$\frac{1}{2}$ pt.

Mix, and administer to an ox or cow. Sheep will take one-fourth : pigs one-sixth part.

In four hours the dose may be repeated, with, however, a reduction of the aconite to twenty drops; and in four hours again a further reduction to fifteen drops. In four hours more ten drops may be given with the same combination, and continued during the same intervals, with careful watching, until evidences of the circulation being affected are obtained. Sheep-skins are sometimes placed on the loins to provide warmth externally; and mustard embrocations are productive of good when the pulse has been reduced. Any continuance of pain is to be treated by opium and astringents, as already directed under "Hæmaturia." The internal administration of camphor, belladonna, hyoscyamus, and injections of the same, are attended with benefit. Prussic acid and tincture of belladonna, mixed in equal proportions and injected endermically—beneath the skin—may be tried for the relief of pain and reduction of the pulse. Working oxen are apt to suffer from a recurrence of nephritis more certainly than other animals. When such have suffered from an attack, careful feeding on recovery should be persisted in, with a view of making them ready for the butcher. Cold and exposure to

wet weather should be avoided as much as possible, and food too rich in nitrogenous compounds should be sparingly and judiciously supplied in the absence of laxative food and means for regular exercise.—*Ed.*]

III.—CHANGES IN FORM AND STRUCTURE OF THE KIDNEYS.

ATROPHY—HYPERTROPHY—ABSCESS—FISTULA, &c.

[The changes that take place in the kidneys, and recognized under the above terms, are not very common. As a rule, they may be traced to previous states of acute congestion or inflammation, arising from sympathy or direct irritation, as already described in the two preceding chapters. In some instances they are associated with the process, and assist in bringing about a more hasty and fatal termination; while in others, and probably with greater frequency, their progress is unnoticed, and signs are obscure and unintelligible for a period, but are succeeded by those of an unmistakable character, which are developed in stages bordering upon dissolution. We propose to discuss each form in a brief manner.

By *Atrophy* is understood a wasting of the tissues of an organ or part of the body; and by *Hypertrophy* is implied a condition the opposite—an enlargement. Most commonly, the conditions are associated in the same animal; we therefore observe one kidney has decreased greatly in size, while the opposite has assumed most gigantic dimensions.

The *Causes* are doubtless manifold. As we have already remarked, these states are common after sthenic hæmaturia and nephritis, and the use of food, medicines, &c., of such a character as to produce a constant stimulation of the kidneys. By conjoint interference with assimilation foreign products are formed in the blood, and require separation, and these may

remembrance of the formation of obstructions in the secreting portion and beyond the obliteration of structure also occurs from good but excessive use. The result is, after the organ becomes unfitted or, at all events, after the work which by absorption takes place, and it becomes which are and useless.

The presence of certain compounds in the blood, waste the influence of which, &c., still continues, and the necessity for an invigorated state of agents as the kidneys is as great as ever. The

the kidney is not to be considered as a token of essential or required. Its office has ceased vir-

For the work and inability to execute more, from its

becoming unfitted for that work, which is being pre-

quently and as forcibly as hitherto. One organ,

being absent, or equal to being so, the office of the

ing is called into greater request, and in reality

work of both to perform. Through this, and the

ntity of blood continually passing through it, the

is stimulated to greater vigour and supplied with

trition. Like the youth who is caused to execute

manual labour, and supplied with good food, he grows

comes more and more fitted for the work which at first

almost incapable of performing. There appears to be

articular change of structure in such hypertrophied or

rged kidneys. They are paler and even softer than usual,

in other respects appear to be normal in character, and

crease in size to two or three times their ordinary capacity.

uch states are seldom recognized during life

The kidneys, like other organs, are subject to peculiar

changes of other characters. The uriniferous tubes

thickened, and obstructions arise; the cysts of the tape

are also found at times, giving rise to similar states;

cular deposits sometimes occur, and at others the

affected by fatty degeneration, or the displac

proper structure of the organ by fat.

Abscess and *Fistula* of the kidney are likewise the result of congestion or inflammation within the organ. As a rule, the former follows closely the disease, and death ensues. There are, however, cases now and then occurring in which urine is voided with difficulty; blood and pus is mingled with it; constitutional symptoms run very high; and after death one of the kidneys is found to be considerably enlarged, an abscess has formed in its interior, and in addition to a communication with



FIG. 134.



FIG. 135.

the bladder by means of the usual passage-ureters, pus is also discharged by an artificial opening into the abdomen. In rarer cases a fistula or canal has formed, by the passage of pus, leading from the affected kidney through the muscles of the loins to the outer flank.

It is not necessary in such cases to speak of treatment further than suggesting that proper to wounds and abscesses generally. Fatal terminations are to be looked for.

In order that the structural changes and abnormalities in form of which we have spoken may be properly distinguished, the appearances of healthy organs from the ox and sheep are represented in the accompanying woodcuts. Fig. 134 exhibits the form and lobulated arrangement of the kidney of the ox;

and Fig. 135 shows, on a section being made, the internal arrangement of the secreting portions of the same organ in sheep.—*Ed.*]

CYSTITIS—INFLAMMATION OF THE BLADDER.

[We have noticed certain causes giving rise to an abnormal state of the urine, and also the effects of particular agents which as sources of irritation produce inflammation of the kidneys. In whatever form those organs are influenced by such causes, the bladder possibly may also suffer conjointly.

Inflammation of the bladder is a common state in cattle suffering from various affections in which the digestive organs are primarily deranged. In Cattle Plague, in the various forms of parturient disease which prevent the animal rising, particularly the apoplectic form, the appearances are frequent. The urine of the cow and sheep in health is alkaline, but under the effects of perverted digestion, besides other compounds of an unnatural or abnormal character being found, acids are abundant. From the accumulation of such urine within the bladder irritation arises, and the secretion of mucous increases as a means of defence against the acrimony of the fluid. The constitution of urine is such as to admit of ready decomposition, particularly as mucous from the bladder, which acts as a ferment, is present in quantity, and the evacuation of the organ is prevented from mechanical pressure, as in the diseases named, or by stranguary, &c. It is during this inevitable decomposition that organic products containing nitrogen are easily broken up, the formation of ammonia secured, and further irritation produced. This is a prolific cause in both cattle and sheep, as well as pigs, and will be referred to again under "Lithiasis," or "Gravel."

Cystitis also occurs from the administration of diuretic medicines, particularly cantharides, which are sometimes inju-

386 *Diseases of the Urinary Organs.*

ditionally given to hasten the sexual desire of bulls, cows, &c. Usually there exist also complications, as enteritis, laryngitis, &c., when cantharides have been given. The affection is always more pronounced in males than females.

Symptoms.—Great uneasiness; nose turned towards the flank (Fig. 136); colicky pains; efforts to vomit; severe constitutional disturbance; the testicles of entire animals are drawn tightly



FIG. 136.—*Cystitis.*

up to the abdomen; great pain and difficulty is experienced in voiding urine which is albuminous; in some instances spasm of the neck of the bladder takes place, and the bladder itself is distended almost to bursting; at others, the flow of urine is greatly accelerated. The presence of a calculus in the bladder or urethral canal will produce all these signs, and the practitioner is required to examine carefully for their presence. General prostration ensues as the disease advances, the fæces become covered with blood and mucous, perspiration is profuse, and death takes place after paralysis or rupture of the bladder is established.

The effect of cantharides hastens the progress of the disease. The mouth and fauces are red, swollen, and painful; sexual excitement is prevalent; gastro-enteritis, and even nephritis, prevails; and death may result in two or three days; but in the other form it may be delayed four or five.

Post mortem Appearances.—The whole course of the alimentary canal from the mouth to the fauces, gullet, fourth compartment of the stomach, and intestines are actively congested

or inflamed, as indicated by the effusion and thickening between the coats. Sometimes the kidneys are inflamed ; but in all the lining membrane of the bladder is acutely affected, and ulceration or erosions are found upon the mucous membrane of the intestines. These appearances, however, do not obtain in ordinary cases of cystitis. The bladder alone may be inflamed and even distended in male animals ; but in such instances the tendency to blood poison is imminent from the non-performance of the functions of the bladder. A state of uræmia is induced, which induces coma and death, and is attended by spots of ecchymosis upon the outside of the bladder and other organs, and a strong odour of urine pervading the tissues, which may have been noticed prior to death.

Treatment.—When cantharides have been used, oil—as a purgative—must be scrupulously avoided, as, by its solvent power upon cantharidine—the active principle of cantharides—greater havoc is induced. Large draughts of linseed infusion, flour and water, and strong solutions of gum arabic in water are serviceable. The bladder should be evacuated as speedily as possible, as detailed at page 370. The bowels require moving by salines, and warm water clysters passed into the rectum at frequent intervals. Sedatives, as the aconite draught (as given at page 235), are required ; mustard embrocations at a later stage to the loins ; and, in most respects, the case will need the same attention as in nephritis generally.—*Ed.*]

LITHIASIS—GRAVEL.

[The disposition which is observed in all organic fluids to alter their constitution when exposed to various influences is greatly manifest in the urine of animals. In no department of veterinary science and management of stock is the necessity for an acquaintance with food in its relation to the organism more apparent than in considering the diseases of the urinary

388 *Diseases of the Urinary Organs.*

organs. It is a matter of simple moment, and requires no stretch of mind to comprehend, that an organ like the stomach can be overloaded, its functions suspended, and, by the formation of gas, in all probability ruptured. Such conditions receive an unresisting or passive kind of acquiescence as an established fact; but the results of such are rarely traced beyond or to other organs.

The great manufacturing organs—the stomach and the intestines—have most important functions, and are liable to disorder more frequently than they have the credit for it. When they suffer, other organs also suffer; when they manufacture unsuited or improper materials, other organs are overworked to expel them from the system; and if a continued supply of such is presented, severe derangement follows. The subject is of the greatest interest to the scientific veterinarian and flockmaster; and although we have already dwelt upon points in intimate relation to it, further remarks will not be out of place here.

If the reader will turn to the analysis of urine of herbivora at page 360, it will be observed that substances called *urca* and *hippuric acid* are among the constituents. These appear to bear a very important relation in the various conditions of the animal. Each represents in the body certain elements, the result of union by chemical and vital processes, and in that form are enabled to leave the body. Their quantity in the urine varies greatly, dependent upon the activity of those processes as influenced by food, exercise, &c. *Urea* is composed of certain elements combined in the following proportions: Carbon 2, hydrogen 4, nitrogen 2, oxygen 2; or, more briefly, $C_2H_4N_2O_2$. When pure, it crystallizes in prisms of a regular form, is colourless, soluble in water and spirit, and has a cooling saline taste. It appears to be formed in the muscles or blood as a result of the waste and decay of the body generally, and depends also greatly upon the amount of nitrogenous food

taken daily. Urea is therefore the form or substance in which form nitrogen is eliminated from the body.

Hippuric acid, on the other hand, is rich in carbon, having the composition of $C_{18}H_8NO_5HO$. This compound, therefore, represents the amount of carbon which the kidneys, in their vicarious action, are called upon to eliminate. Hippuric acid is also a crystalline substance, readily soluble, and is found, on separation from the urine, as long slender prisms, and its solution has an acid reaction.

The relation that these substances bear to each other depends, as already said, upon the activity of the processes which generate them. When cattle are confined to the stall, and sheep to the fold or small pastures, the quantity of urea diminishes, simply because the animal takes no exercise, and the body does not waste much. The quantity of urea, then, more particularly represents the amount of albuminous or nitrogenous portions of food, such as beans, peas, lentils, oil-cake, &c., which are rich in nitrogen, or flesh-producing elements. At this time also the hippuric acid increases. As the representative of carbon, it is formed at the expense of all vegetable acids taken into the system, as the oxalic, citric, racemic, &c., which are rich in carbon. Such urine in health has an alkaline reaction, as all vegetables contain large quantities of soda, potash, magnesia, and lime, in union with the vegetable acids referred to, which change places, as it were, with the acids formed in the system: thus the citrates of lime, magnesia, soda, together with the oxalates of the same salts, become *hippurates*; or, in other words, the vegetable acids leave the salts named, which are taken up by the hippuric acid formed at their expense in the general combustion going on within the body.

When the ox or sheep, on the other hand, are fed upon grass, and allowed the run of meadows, pastures, and hills, the urea then increases, as greater waste occurs, and the

results are found in the shape of this crystallizable compound within the urine. Hippuric acid, on the contrary, is in less amount, carbonic acid probably replacing it in the urine in union with the salts already named, and upon which the alkalinity depends. The healthy state of digestion is of great importance to the whole system, as providing from food the proper ingredients in a state requisite for the different processes, which, united, form the great one of nutrition and growth. Bad food contains insufficient material for support, and disturbs the functions in such a manner that foreign products are formed, as we stated under albuminuria and red water ; and conversely, when rich food is given without proper exercise, the elements are in excess of the requirements, and an abnormal action is often the result.

The urine of carnivora is acid. This results from the development of uric and lithic acids in the general burning or decomposition of the elements of flesh food rich in nitrogen. The alkalies in that food are slight, and in union with phosphoric acid : hence the common prevalence of phosphates as solid deposits in their urine. This is a normal condition ; but to become alkaline would be far from a healthy condition. Likewise in cattle and sheep, when rich nitrogenous food—as corn, beans, peas, &c.—is allowed in abundance, with little exercise, the system cannot appropriate the whole : they are imperfectly burned. The phosphates of the grain accumulate, urea results in too large quantity from the decomposition of nitrogenous principles, and magnesia abounds largely. The urine now becomes acid, and continues to possess this reaction from the presence of uric and lithic acids ; and in the process of being discharged from the body by the kidneys, in its way to the bladder along the ureters, or in the bladder itself, deposits of these solid and unnatural ingredients occur.

In the first place, the acid reaction of urine produces an irritant effect upon the bladder, which induces it to contract ;

and hence the frequent discharge that occurs. Shortly the urine becomes alkaline. Mucous is secreted in large quantity from the inner surface or mucous membrane of the bladder, and acts as a ferment to the organic compounds in the urine. Urea is quickly decomposed, and is changed into ammonia. Magnesia and phosphoric acid being also present, these three contribute to form either a sandy (sabulous) deposit of small particles, or a few larger ones called calculi or stones ; and thus we obtain, by aggregation of the particles and continuance of the disorder, the ammonio-magnesian-sabulous deposit, or a calculus of the same kind.

This, however, is not an invariable composition, as oxalate of lime, phosphate of lime, silicic acid, &c., are also found ; and although they may exist in combination, yet there are many cases where one variety of deposit occurs, or, at least, preponderates largely as a result of the imperfect assimilation and presence of an excess of material under abnormal states.

The accumulations of urinary deposits of the nature referred to are very common to the male animals among sheep. This is not intended to convey an idea that they are rare in other animals. Cattle and sheep, male and female, subjected to the processes of feeding we have named, and having little exercise, are equally as liable to their formation ; but by reason of anatomical peculiarities which prevail the results are different. In females the passage from the bladder is short and nearly straight ; and in the ox the passage (urethra), although long and tortuous, as shown in the engraving (Fig. 137), is nevertheless capable of allowing much of the formed deposit to pass away. In the male of sheep the terminal part of the penis is very much contracted, and the flow of urine through this *appendix vermiformis*, or worm-like appendage, is small and retarded. In both animals may be seen at times a number of diminutive calculi hanging from the wool and hairs at the end of the sheath of the penis, where they have been formed by

the constant trickling down of urine impregnated with the materials in solution. Frequently the obstruction is observed at the end of the penis. The small orifice is quickly filled; the discharge of urine is impossible; the bladder is distended, and, if not relieved, bursts; or, at other times, absorption of the urine occurs, and all parts of the body—and particularly the skin during life—acquires a strong urinous odour. The animal is subjected to uræmia—a form of blood poisoning—and at length becomes unconscious and dies. (See “Uræmia,” page 56.)

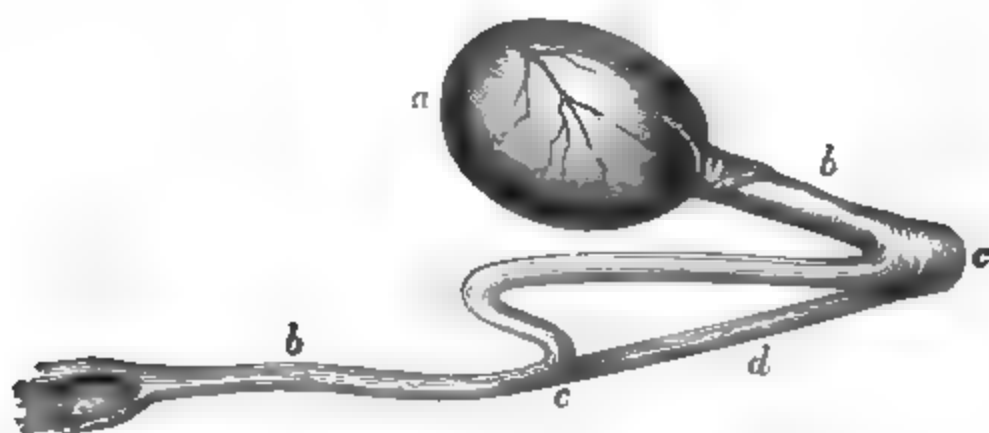


FIG. 137. - *Urethral Canal of the Ox.*

a. Bladder of the Ox.
b. Urethral Canal.

c. Curves of the Urethral Canal.
d. Retractor Muscle of the Penis.

In some instances the bladder contains a large amount of this gritty deposit; and cattle, as well as sheep, may be observed to pass a great quantity at each urination. Accumulations also take place in the cavity called the pelvis of the kidney, in the tubes (ureters) leading from the kidneys to the bladder, and in the urethra or passage from the bladder outwardly. The colour varies: sometimes it is white or grey; at others, dark-coloured and even black, and possesses a strong ammoniacal odour. The accumulations, as already stated, also take the form of separate stones called calculi, and are located differently. When they are situated in the kidney, they are called *renal* calculi; when in the ureters, *ureteral*; in the bladder, *vesical*; in the urethra, *urethral*; at the end of the penis, *pre-*

putial. The gravel or urinary deposit, according to locality is also known by the same terms.

We have, further, brief remarks to offer on the several varieties.

Renal calculi occur of various sizes, ranging from a millet-seed to a pea or bean, having a bright metallic lustre on the



FIG. 138.

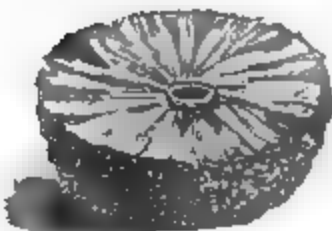


FIG. 140.



FIG. 139.

Calculi from the Urinary Passages.

Various forms in which the Ammonio-magnesian Phosphatic Calculi are found. Fig. 138 is whole; 139 and 140 are sections showing the internal concentric and radiating lamellar structures.

outer surface, and disposed of concentric layers internally. Several are frequently found in the same kidney, sometimes in the pelvis, at others in the substance of the gland, imbedded in adventitious matter thrown around them. The signs which they produce are by no means of a regular and decisive character. They are frequently unrecognized during life, having given rise to little or no inconvenience. Usually colicky pains, with tenderness over the loins, blood and sabulous deposit discharged with the urine, are the most common, with those of nephritis more or less. Treatment is here only palliative.

Ureteral calculi (stone in the ureters).—When renal stones are small, they may possibly pass into the ureters and lodge there, giving rise to constantly recurrent colic of an excruciating character. Dilatation occurs between the obstruction

394 *Diseases of the Urinary Organs.*

and kidney, the function of the gland is interfered with and eventually arrested, when wasting (atrophy) takes place. If the hand is passed up the rectum of large animals, the obstruction may be felt, and, if small, moved from the spot; but relief is not possible any further.

Vesical calculi (stone in the bladder). — Of this variety sometimes large concretions are found, having produced little or no inconvenience during life; but when smaller ones exist they are frequently pressed onwards with the flow of urine towards the neck of the bladder, and block up the orifice, when urgent symptoms of distension take place. In ordinary states animals suffering from the presence of stone in the bladder have an awkward gait, with more or less stiffness; blood and sediment accompany the urine; colic is occasionally present; frequent attempts to urinate are made; and the bladder is found distended, from the stone obstructing the mouth. If the hand is passed up the rectum, the state of affairs is soon revealed in extreme sensibility, and passage of the catheter in females will detect the stone by striking against it.

Removal is to be attempted by dilatation of the vaginovesical opening, when, if the stone is not large, it may be withdrawn by the fingers; otherwise forceps must be used, and, if required, the stone must be crushed. In the male, an opening must be made over the ischiatic notch, as detailed at page 367, the orifice being dilated and stone removed or crushed.

Urethral calculi (stone in the urethra or canal of the penis). — These are located at various parts of the canal, having passed from the bladder. The most common parts in oxen are the curves midway between the bladder and prepuce. After becoming lodged there spasm occurs, and the tube contracts forcibly around it, when pain from the subsequent distension of the bladder arises, colic, stamping with hind legs,

kicking at the belly, &c. Rams are also subject to this variety, which lodge in the appendix vermiformis, or narrow end referred to. Examination of the penis in both cases leads to the detection of the stones. For this purpose, cattle must be secured by strapping together their hind legs or being cast, and sheep should be turned upon the haunches. When the stone is detected, an incision is made longitudinally in the penis direct upon the obstruction; after extraction, the wound is secured by a few stitches. The signs manifested are those of retention of urine, which assume a most urgent character. In some cases irritation is set up, and the calculus is discharged through the outside as a result of suppuration; but if it occurs in the ram at the vermiform process, the probability is he will be no longer useful as a procreative animal.

Preputial calculi (stone in the prepuce or sheath).—These have already been noticed as occurring on the wool and hairs surrounding the prepuce of rams, wethers, and oxen. Pigs are sometimes affected with stone inside, which presses upon the penis, and leads to retention of urine and even strangury. They admit of easy removal, when the parts should be cleansed and lubricated.

The general treatment of lithiasis consists of washing out the bladder and urethra by means of a syringe, which is readily accomplished in females, but in males of the ovine and bovine race the urethra may require to be opened for that purpose at the ischiatic notch. Weak solutions of hydrochloric acid are useful in attempting a solution of the sediment, and doses of the acid are beneficially administered internally.

In all cases the diet should be strictly attended to, and where such deposits are found among oxen and sheep, it should be an incentive to a rigid investigation into the nature of food and water, with a view of averting the consequences.

Large quantities of the carbonates of soda and potash are recommended by some practitioners, with the view of pro-

viding the necessary alkalies in the blood. Such may assist in preventing the future formation of phosphatic stones or deposit, by combining with the phosphoric and other acids, and forming soluble phosphates; but where large deposits are present, they should be first removed if possible.—*Ed.*]

PROLAPSUS VESICÆ OR INVERSION OF THE BLADDER.

[This is a most untoward occurrence, and not unfrequently attended with results of a fatal character. Usually it takes place in consequence of difficult labour, or from the effects of violent straining afterwards. We have known it to occur after large doses of irritant medicines, as saltpetre, cantharides, resins, and turpentine, &c., have been exhibited. Violent



FIG. 141.—*Inversion of the Bladder.*

efforts to urinate are first made, and succeeded by absolute straining, during which a rent takes place in the vagina, admitting the bladder to pass towards the mouth externally, where it appears as a bright red fluctuating tumour, containing fluid. Distension is apt to become severe in conse-

quence of the inability to discharge the contents, the neck having become twisted, or, by pressure forcibly exerted upon it, obliterating the passage.

Treatment.—This calls for considerable skill. The bladder must be carefully returned to its position, and the wound through which it has passed closed by sutures. The cause of straining must be ascertained and reduced as far as possible, and under certain circumstances repelled by the use of opium, belladonna, hyoscyamus, prussic acid, &c., &c.—*Ed.*]

SECTION VI.
DISEASES OF THE ORGANS
OF GENERATION.

DISEASES OF THE ORGANS OF GENERATION.

ABORTION.

Abortion, or cows slipping their calves in an early period of gestation, is a great misfortune to the owner: it appears that cows in the best condition are the most liable to this misfortune. It is sometimes occasioned by accidents, which frequently happen to them during the summer. At other times it has appeared of an epidemical nature, several having slipped their calves in the course of a few days: in this case it appears to proceed from debility and a relaxation of the generative parts.

Cows are the most liable to slink their calves towards the latter end of the year, while feeding on fog or autumnal grasses, or on low marshy and fenny grounds; and at other times it has proceeded from the smell of *carrion*, which may have been exposed in the pasture, or too slightly covered with earth. The *sense of smell* in horned cattle is *remarkably acute*: the Author has known them on a warm day, in an open pasture, collect in great numbers to a particular spot, where some dead carcases had been buried several years, and with their horns and feet tear up the earth in a surprising manner, at the same time making a most horrid noise.

Some cows are constantly “bulling” every fortnight or three weeks during the summer; [and by their disposition to dis-

400 *Diseases of the Organs of Generation.*

turb others by leaping upon them, destroy the connection between mother and foetus.

The affection is variously known as *miscarriage*, *slinking*, *sauntering and picking*, or *slipping the young*. It is most common in the cow, but occurs also in other animals. The term "abortion" is most properly confined to the earlier periods of gestation, when a morbid expulsion of the foetus takes place before the necessary conditions for parturition are developed. It is usual to divide the period of gestation, viz., forty weeks or two hundred and eighty days, into two parts: the first part comprising six months, the second three months and the remaining days. To all those cases in which the foetus is expelled before the termination of the first part, the term "abortion" is applied, and those occurring afterwards are known as cases of *premature labour*.

We shall observe this distinction in reference to the subject under consideration, and as a means of separating it from those states which are frequently confounded with it.

Abortion frequently proves a source of continued loss and anxiety to the stock-breeder, from the numerous instances in which pregnant animals expel the foetus after one of their number has committed the act. The malady appears to run through a herd with almost electric celerity, and, in some instances, even partakes of enzoötic characters, from which it has been considered to possess contagious properties. We are, however, now certain that such a conclusion is an erroneous one, and can confidently account for the disease in excessive plethora, presence of pugnacious animals, disposition to chase each other, derangement of digestive or urinary organs, leading to violent straining, colic, &c., blows, falls, leaps, &c., and all such influences that are likely to sever the connection between mother and foetus. These may be termed vital and mechanical causes.

Professor Tanner—*vide* "Veterinary Review," Vol. I.—main-

Diseases of the Organs of Generation. 401

tains this disease occurs in more instances than are either discovered or admitted, from the effects of the ergot of rye-grass, to which is awarded similar ecbolic properties as are supposed to obtain in the ergot of rye. A humid atmosphere or wet season, he states, are required to produce the ergot upon fully ripened seeds. This, however, fails to account for abortion, which occurs as often in dry seasons.

Symptoms.—The animal exhibits an amount of dulness, loss of appetite, and suspended rumination. If in the field, she will be found away from the rest of the herd. A yellow, glairy discharge issues from the vagina. Subsequently these states are considerably aggravated; the abdomen becomes pendulous and lower than heretofore; vaginal discharge acquires a thicker consistence and a darker colour, becoming red and offensive. Respiration and circulation are quickened, and the pulse, somewhat hard, full, and frequent at first, has now become smaller and wiry. External temperature is unequal, and colicky pains are evident, with great uneasiness; and with greater or less difficulty, in proportion to the period of gestation as influencing the development of the foetus, the expulsion takes place, and may be attended with *flooding*.

Treatment.—Evacuate the rectum by clysters of warm water, and clear the bowels by a purgative or laxative in accordance with conditions.

RECIPE NO. 128.

Take of Epsom salts	12 to 16 oz.
Sulphur	2 „ 4 „
Ginger and gentian, of each	1 „

Mix, and give in warm ale and treacle. Sheep may receive one-fourth. In those cases where the uterus lacks power of contraction and inability to expel the foetus, give the following :

RECIPE NO. 129.

Take of aromatic spirits of ammonia	2 or 3 oz.
Tincture of cardamoms	1 „

402 *Diseases of the Organs of Generation.*

Mix, and give in a quart of cold ale to a cow, and one-fourth for sheep, or the following :

RECIPE NO. 130.

Take of ergot of rye, in powder..... 4 drs.
Ginger, in powder 1 oz.

Mix, and give to a cow in a pint of ale.

RECIPE NO. 131.

(For a sheep.)

Take of ergot of rye, in powder..... $\frac{1}{2}$ dr.
Ginger, in powder 2 „

Mix, and give in half a pint of ale.

These doses may be repeated each hour until the desired effects are obtained.

The membranes should be removed as soon as possible—especially if they have become offensive from putrefaction, when any of the following mixtures may be used in order to correct the effluvia. The solutions should be injected into the vagina and womb by means of a suitable syringe.

RECIPE NO. 132.

Take of solution of pure carbolic acid (see Appendix) $\frac{1}{2}$ oz.
Water $\frac{1}{2}$ gall.

RECIPE NO. 133.

Take of chlorine water (see Appendix) $\frac{1}{2}$ pt.
Water $\frac{1}{2}$ gall.

RECIPE NO. 134.

Take of chloride of zinc 1 dr.
Water 4 pts.

RECIPE NO. 135.

Take of solution of perchloride of iron 2 drs.
Water 1 qt.

Besides these, Cond's Fluid, solutions of chloride of lime, M'Dougall's Disinfecting Powder, &c., &c., are of great service.

Plethoric animals, when under high fever, should be bled moderately in the first stages; and it may be necessary also

to give a purgative of additional strength, followed by the subjoined :

RECIPE No. 136.

Take of solution of acetate of ammonia 4 oz.
Fleming's Tincture of Aconite 20 drops.

Mix, and repeat every four hours, reducing, however, the aconite five drops at each dose until ten only are given, when the draught may be continued until the pulse exhibits indications of being affected. The febrile stage passed, diffusible stimulants and stomachics are required.

All affected animals should be segregated from the rest, and the foetus and membranes disposed of by prompt burial. Good housing, cleanliness, ventilation, and domestic comfort should be provided. Animals affected with *nymphomania*—commonly termed “bullers”—should not be allowed to mix with pregnant ones. The nature of food (as having a tendency to induce plethora or constipation) should receive consideration, and all known causes neutralized as far as possible with a view of preventing a spread of the malady among others.

Abortion is *not* contagious. The rapidity and certainty with which animals successively abort, is, doubtless, caused by a morbid nervous excitement, of which the cow is peculiarly sensible, inducing a general uneasiness in which premature contraction of the womb is ensured, or detachment of the usual means of connection between mother and foetus, and, consequently, death of the latter.—*Ed.*]

PREMATURE LABOUR.

[This may be viewed as an advanced and aggravated stage of abortion. The longer the foetus is retained within the womb, and the nearer it approaches in the gradual stages of development to the time of parturition, the greater is the provision made for that time and difficulty attending the morbid attempts at expulsion.

404 *Diseases of the Organs of Generation.*

In all probability the causes, when of a violent character, have also contributed towards a false or unnatural position of the foetus, and, in addition, the external parts, as the haunches, &c., are in no way prepared for its safe and easy passage. The *os uteri* is closed and firmly contracted ; the admission of even a finger is all but impossible ; or the protrusion of one foot is all that is permitted to appear as an evidence of an internal state of affairs. The animal moans, grinds her teeth, and suffers acutely ; the pulse is rapid and feeble ; the slipping of hair or wool from the exposed member indicates the calf or lamb has been dead some time ; and the rapid approach of weakness prevents the animal standing.

Such conditions are anything but promising to the practitioner ; but notwithstanding the unfavourable aspect which affairs assume, delivery may be effected, and the animal afterwards recover and do well. The owner, however, should be warned of the great probability of a fatal issue, that he may decide whether the attempt to extract the calf by the usual method should be made, or the Cæsarian operation adopted.

When ordinary means of extraction are to be carried out, the operator must first attempt the dilatation of the *os uteri* or mouth of the womb ; and for that object frequent diffusible stimulants should be administered. Alcohol, in its various forms, sulphuric ether, chloroform, chloric ether, &c., are suitable, and should be combined with opium or belladonna. A solution of belladonna is carried up the vagina by means of a sponge, and frequent but careful attempts are made to dilate the opening. By patience, this is effected ; when the operator must ascertain the exact position of the foetus, and proceed in the way hereafter to be described under "Natural Presentations," or by the directions given in the chapter on "Embryotomy." Subsequent treatment may be pursued as directed for "Abortion."—*Ed.*]

HOW TO EXTRACT A CALF WHEN IT PRESENTS ITSELF
IN A WRONG POSITION.

Persons of all descriptions, who have anything to do with neat cattle, are, or ought to be, well acquainted with the manner in which a calf should present itself when in a natural or proper position.

All those positions are called *unnatural* in which the calf presents itself otherwise than *with its head and fore feet first, and its back towards the cow's back*. It is well known to all who have the management of cows, or those who practise in

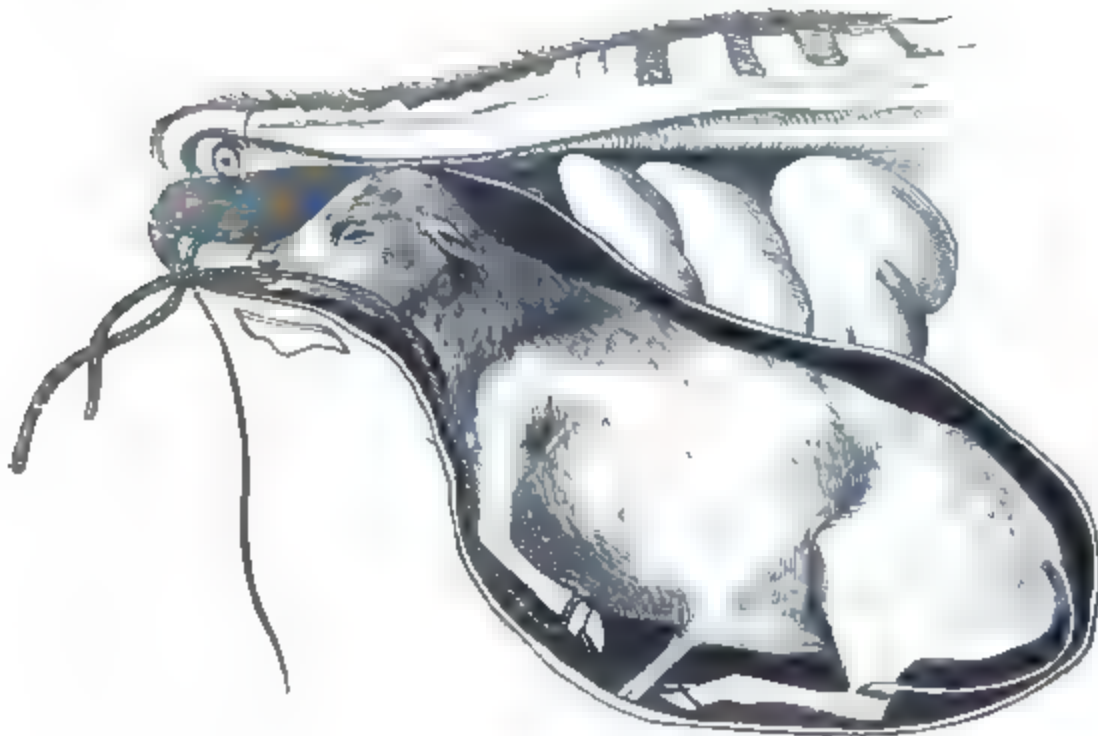


FIG. 142.

medicine amongst them, that calves are very commonly presented in a variety of different postures, for which no just reason can be assigned. And whenever they present themselves in a wrong posture, both cow and calf are in danger, and that more or less according to the *ability of the person employed to give the necessary assistance*.

In the first place, then, after the waters are broke, and only

406 *Diseases of the Organs of Generation.*

the head and foot present themselves, you must lay hold of the calf's head and wait till the throes are off, then gently push it back, and rectify the other foot ; after which it may be extracted without danger.

[The method of accomplishing this is not unattended with difficulty, in consequence of the protruding foot limiting the passage and strong pains of the cow. In the absence of other appliances, the common plough-line, having a small end, is a most valuable aid. A running noose is formed upon it, and carried by the hand into the uterus. The arm is first reached and brought upwards, when the hand is passed along over the knee until the foot is reached and rope secured upon it (Fig. 142).

The protruding foot previously secured is then pushed backwards, taking care to guard the hoof by the hand ; next, by drawing the other rope and holding back the foetus, the opposite foot can be raised to the passage, and placed side by side with the other. The nose is now held and directed towards the passage, and by gentle and careful traction delivery is readily effected.—*Ed.*]

Secondly, If the head only present itself and both feet are left behind, the head must be pushed back with a gentle hand, as soon as her throes are off, and the feet properly placed with the utmost care, lest by any means you wound or tear the uterus.

[In this position cords are passed over both fetlocks, the head being pushed back as detailed in the preceding case, and succeeding arrangements ordered likewise. Modifications of this position are not unfrequently met with, causing a great amount of trouble,—one of which is shown in Fig. 143. The head is here fixed against the pelvic bones, while one foot only protrudes. In this case the latter must be secured, and the foetus pushed back while the hand is in the womb, in order to raise the nose and other foot as soon as space will admit. In this way calves may be delivered alive. If difficulty occurs, a hook may be inserted into each orbit, the nose being

directed into the passage during traction after the opposite foot has been raised. Some practitioners use a cord round the lower jaw; but this is apt to slip off. The double hook,

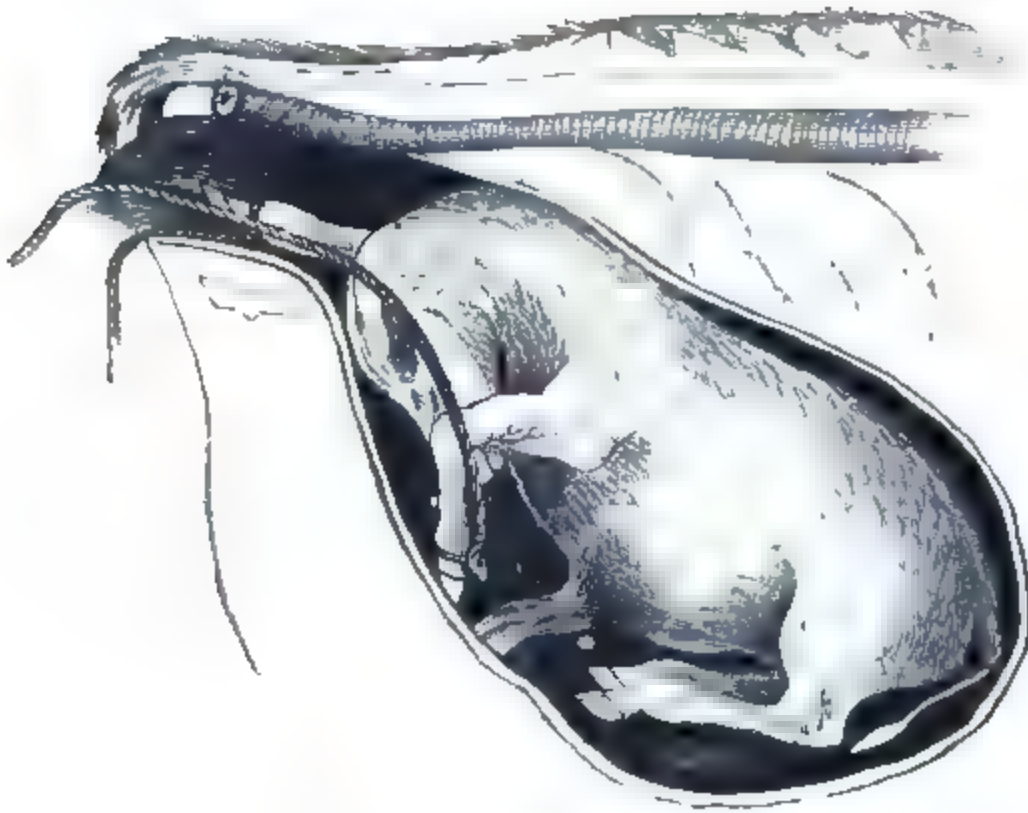


FIG. 143.

shown in Fig. 144, is most serviceable, or single hooks, as in Fig. 145, for insertion in the orbits.



FIG. 144.



FIG. 145.

In some instances the head only is presented, as in Fig. 146, or it is turned backwards, in addition to the fore leg being beneath, as seen in Fig. 152, or both legs only may protrude,

408 *Diseases of the Organs of Generation.*

while the curved part of the neck fills up the inner opening of the pelvis, and admits of too little space for work.

In the first instance the head must be pushed back, and the feet raised as directed in details given in the preceding paragraph. The protruding limbs should be at once secured by ropes (or if one is only appearing, the other must be gathered up as soon as possible, the body being pushed back for the purpose as already described). This done, the foetus is then to be moved, in order that the arm may be passed in and nose reached by the hand, when by patience and strong efforts the head may be turned. Careful pulling at the cords, with the operator's hands guiding the nose, will generally effect a delivery.

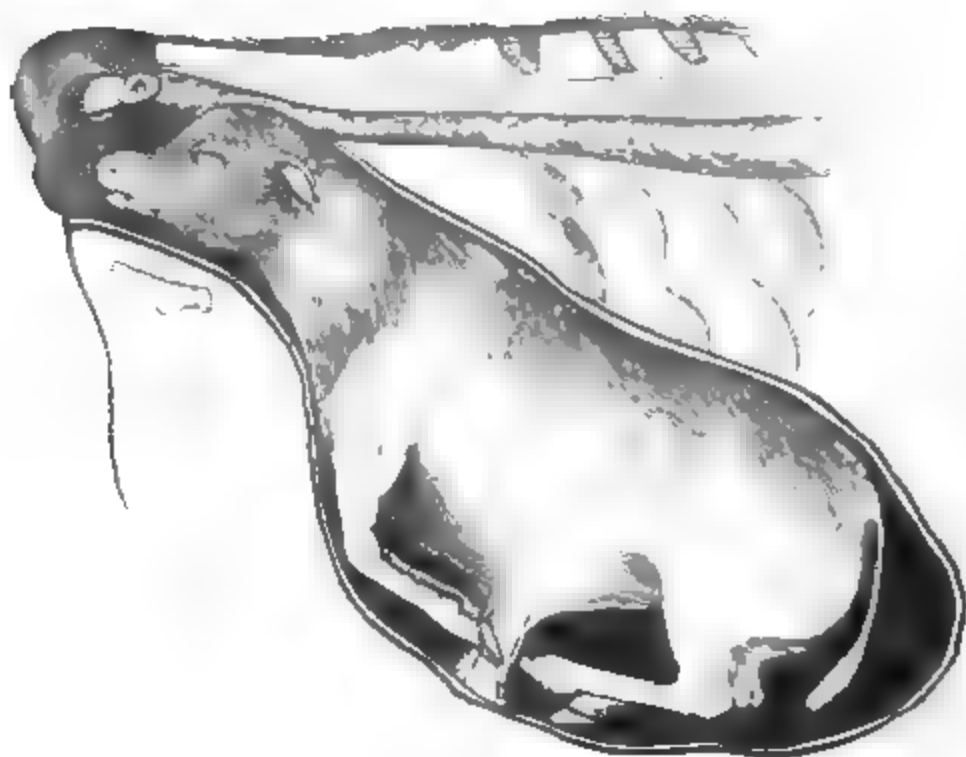


FIG. 146.

If this cannot be done, hooks may be inserted in the cheek or orbit of the free side, and, by traction, while the body is pushed backwards from the chest, the head may be turned and delivery accomplished. This is, however, not always successful, and the operator must resort to practical *embryotomy* or cutting up the foetus. For this purpose a small curved

blade, provided with a ring for the middle finger, is used. When in position, it is guarded by the fingers on each side, and carefully passed into the womb along the protruding limb as far as the shoulder-blade. The point of the blade is pressed upon the skin, and as the hand is withdrawn, an incision is made the whole length of the limb. A circular incision is then made above the fetlock, and the skin dissected from the bones and muscles as high as the protruded limb will admit. The

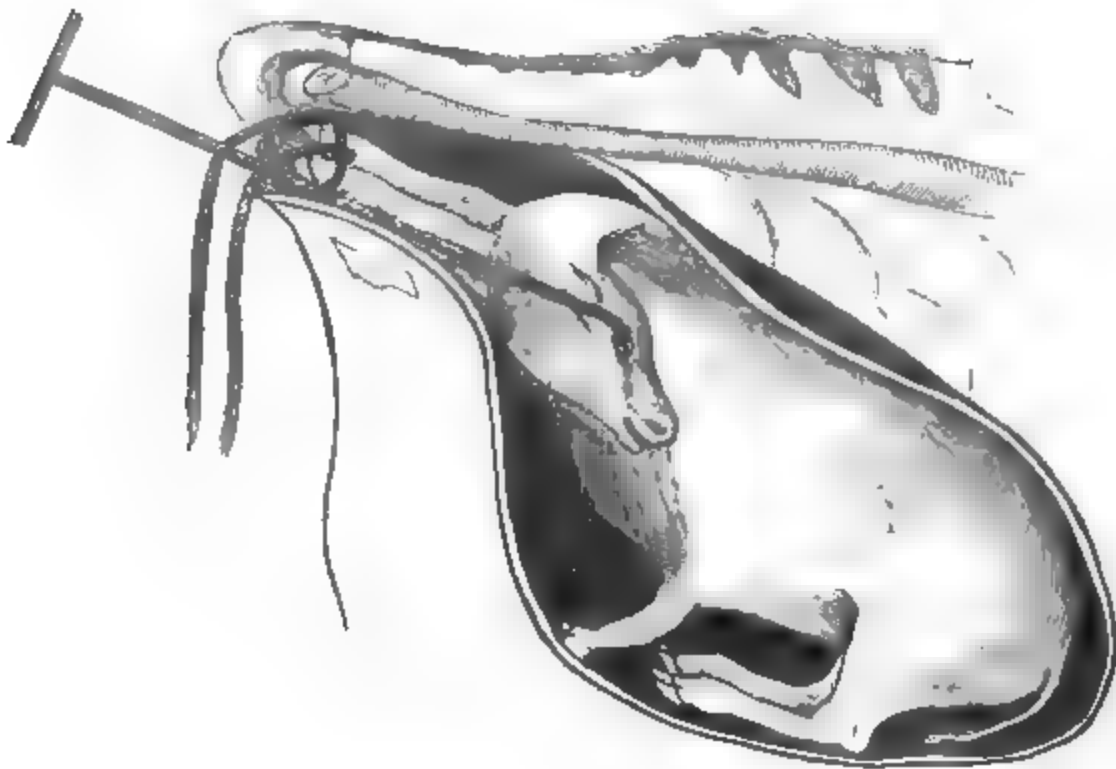


FIG. 147.

fingers are next carried between the skin and parts to which it is attached, in order to effect a further separation as high as possible. When this has been accomplished, steady force being applied to the rope, the limb gradually moves, and at length rapidly comes away, rupture of the muscles uniting it to the trunk taking place. Greater space being thus given the other limb, and head, if turned back, may be raised without much difficulty. It is a good plan to attach a rope to the skin of the amputated limb as an extra means of traction, and it

410 *Diseases of the Organs of Generation.*

may be necessary also to sever the opposite limb as the first was done.—*Ed.*]

Thirdly, If all the four feet be turned where the back ought to be, towards the top of the uterus, in this situation it will be

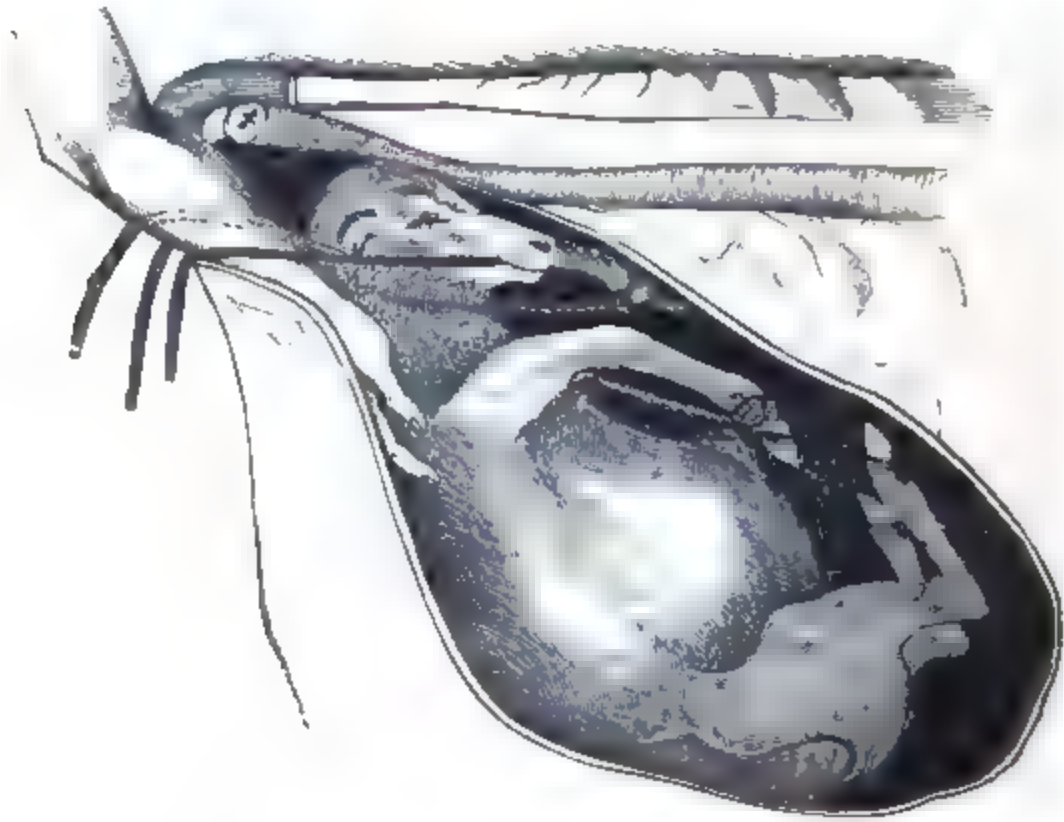


FIG. 148.

impossible to extract the foetus until it be put in a proper position. In operations of this kind, everything depends upon the management and activity of the person employed in putting the beast into a favourable posture. The hind parts of the cow must be sufficiently raised with straw, or otherwise with bags filled with that or anything else that is soft and easy to lie on, and properly placed under her. By these means the person will be very much assisted in putting the calf in a suitable posture for extraction: afterwards wait a little until her throes or pains return, and then give nature your best assistance.

[In the sow and ewe this position is easily improved by absolutely turning the foetus: in the cow it is frequently im-

possible. To attempt this, proceed as follows: Let a rope be secured upon the jaw, and others upon the fore feet or fetlocks, as shown in the figure (Fig. 148), one of which must be *outside* the leg of the opposite side. The operator then passes his hand down beneath the neck of the foetus to the top of the shoulders, and exerts as much force as possible in rotating the animal, while the outside rope is pulled by an assistant. If this is properly arranged, it will be obvious that the forces thus applied are calculated to turn the calf in one direction until the natural position is secured, when delivery may be accomplished.

This position is at times most difficult to deal with on

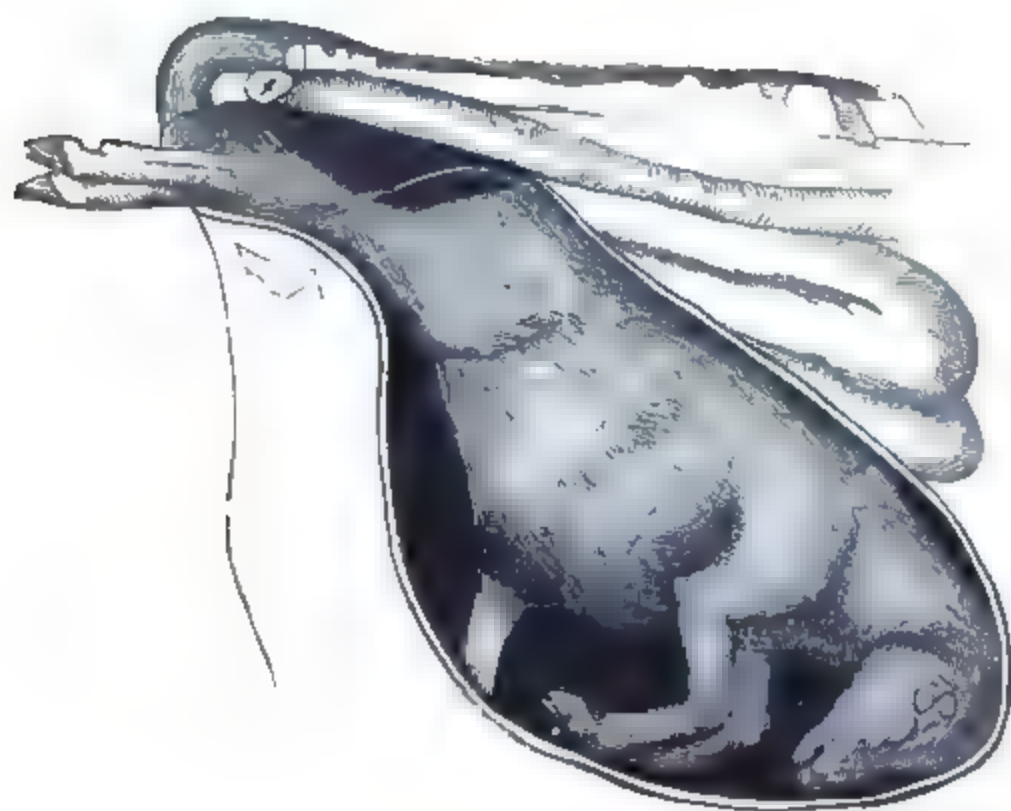


FIG. 149.

account of the violent throes of the cow. Turning is then impossible, and the practitioner has no alternative but to amputate the fore limbs as already described, and thus acquire more room and ease for operating.—*Ed.*]

Fourthly. It sometimes happens that the hind legs make

412 *Diseases of the Organs of Generation.*

their first appearance: in this case it will be found better to extract them in that position than to attempt to turn them.

[A modification also occurs in some animals in which the

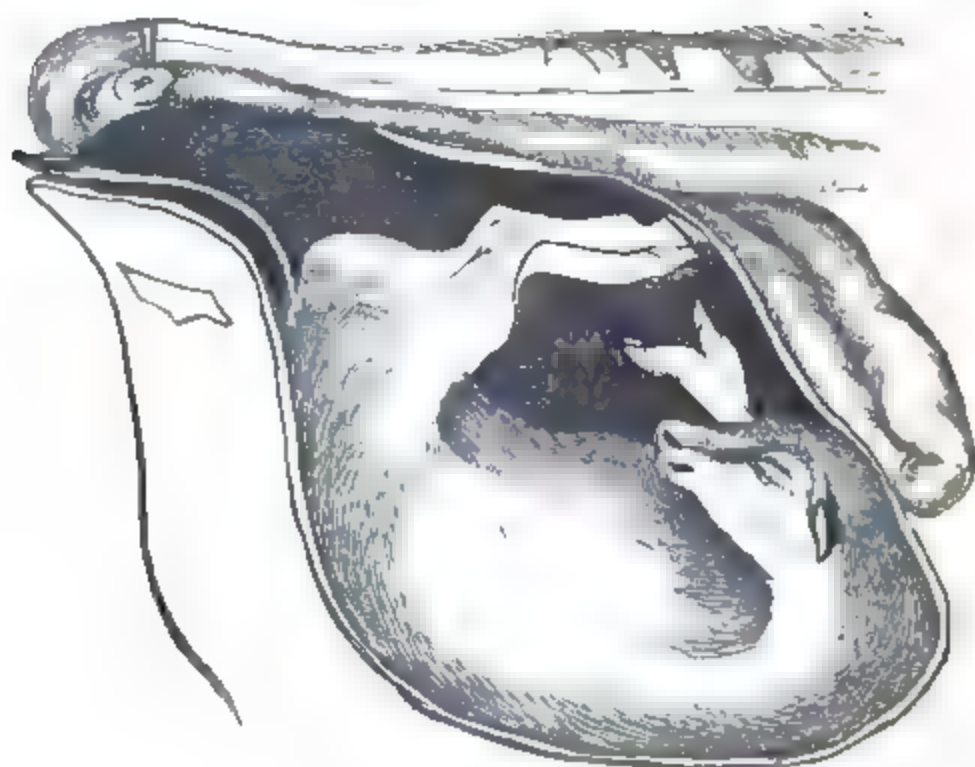


FIG. 150.

foetus is presented with the hind limbs pressed up against the loins of the mother (Fig. 150). When such a state is met with, the calf should be pushed backwards and downwards, and the hind legs seized and directed into the passage. If delivery cannot be effected, amputation must be resorted to.—*Ed.*]

[Fifthly. Probably the most difficult position in which the foetus is found is that in which the hind parts are presented—the feet downwards, and back opposed to the loins of the mother, as shown in Fig. 151. Such is known as a “breech presentation.” Here, then, exists no part from which traction can be employed; and, moreover, the space is so limited, that even introduction of the hand is not an easy matter, while the pains of the mother are violent and continued.

No benefit can possibly be obtained unless the hind legs are raised into the passage, which is to be effected by passing

cords round the thigh, by means of a stilette having an eye through which the cords are fixed. The foetus must also be pushed farther into the womb, and each leg gradually raised by pulling with the cords attached first at the hocks, so as to secure each at the fetlock joints. When this has been accomplished, the calf must again be pushed into the womb by a crutch in the hands of an assistant, and each foot raised into the passage, partly by the cords, and the hand carefully guarding the hoof. The animal will then be raised to the position given in Fig. 149, when, traction being applied, delivery may be easily performed.—*Ed.*]

Sixthly, Frequent instances have occurred where the shoulder

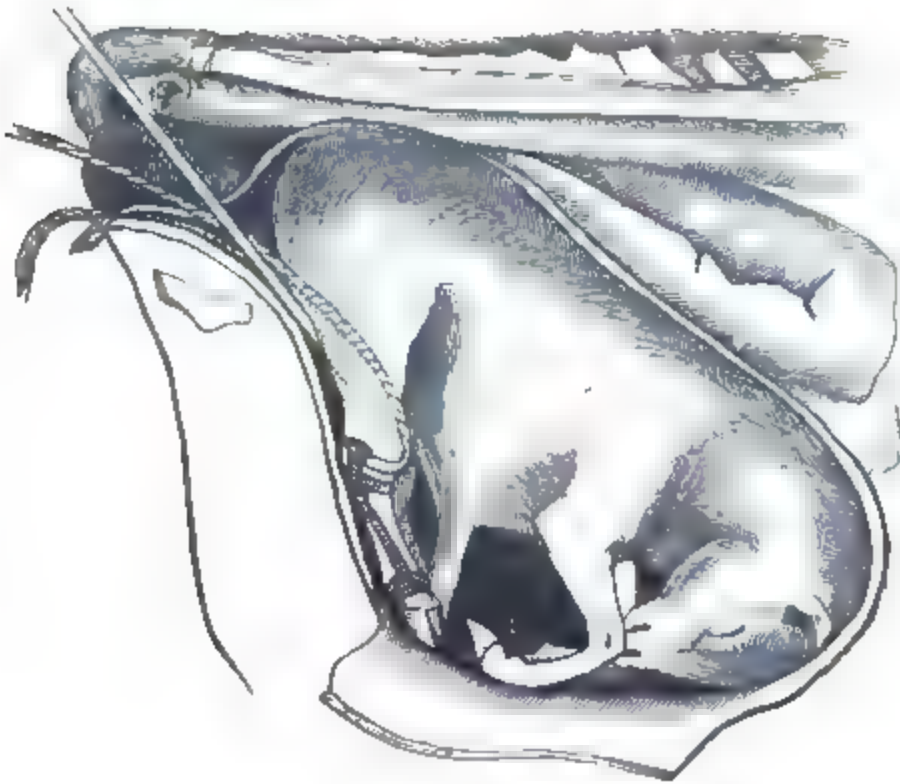


FIG. 151.

has presented itself first at the mouth of the uterus: this is a difficult case, and requires the hand to be introduced in search for the fore legs; or, if thought more proper, the hind legs may be brought forward: this must be left to the judgment of the person employed.

414 *Diseases of the Organs of Generation.*

[In shoulder, or rather neck, presentations (Fig. 152), the practitioner should endeavour to bring up the head and fore limbs, as already detailed under the second form of abnormal presentation. This failing, amputation of the fore limbs must

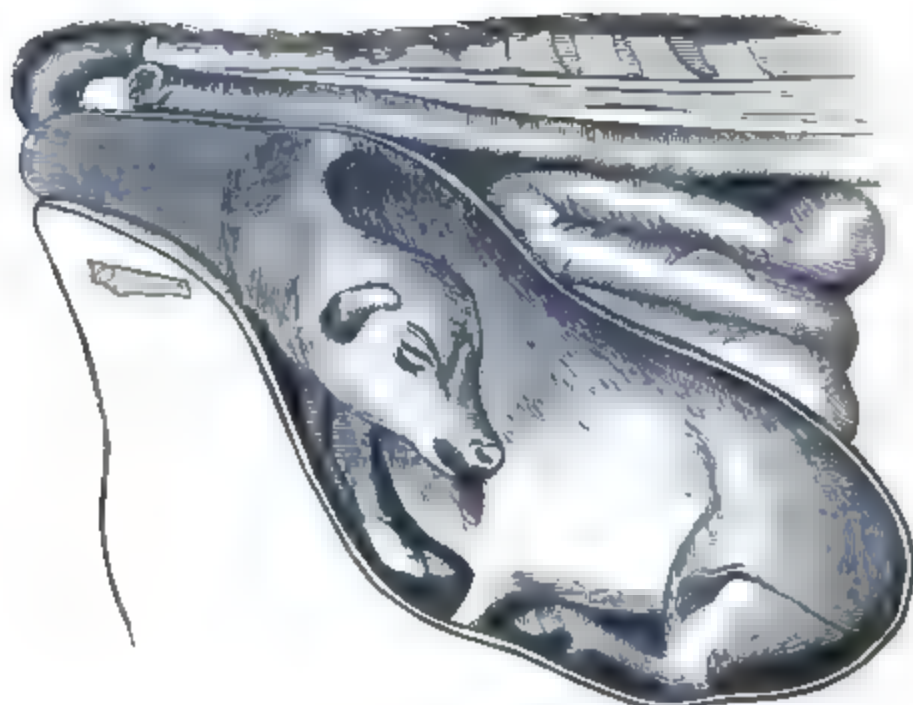


FIG. 152.

be resorted to. When the head can be seized, and after being directed into the passage, assisted by ropes attached to the skin of the amputated extremities, the animal may be quickly delivered.

Seventh. In addition to the foregoing preternatural presentations, delivery is sometimes also greatly retarded by abnormalities of form, and at others even rendered impossible. In the cow and sheep, and not unfrequently the sow, strange and hideous-looking monsters are seen. Sometimes two animals are curiously blended, while the appearances of others are such that the sex and nature are almost unrecognizable. Contortions of the spine, displacement of organs, immense increase of size in others, &c., variably take place, and interfere greatly with labour, even when the positions are quite natural. Two forms of enlargement are very common, viz., *hydrocephalus*, or water in the head; and *ascites*, or dropsy of the abdomen.

Hydrocephalus.— This is commonly met with in cows of attenuated form, the produce of finely-bred animals. The enormous size of the head of the calf is the obstruction to delivery, and is ordinarily presented in two forms: first, the nose appearing; second, the forehead, the nose being towards the breast, as in Fig. 143. Hydrocephalus, however, may occur in foetuses exhibiting all the abnormal presentations.

When the state of the head is observed in the position last referred to, the foetus should be pushed back, and the head placed in the position of Fig. 153, when, with a suitable knife or trocar, a puncture is made, and the fluid evacuated. After-

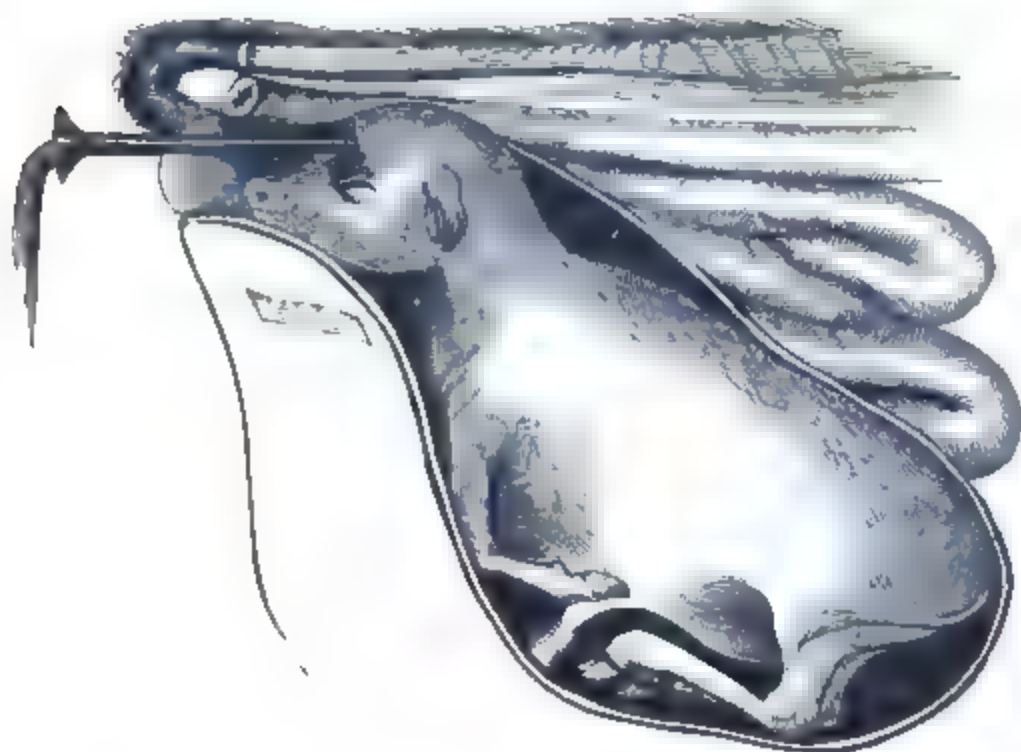


FIG. 153.

wards the nose is to be pulled up, traction being exerted upon the ropes previously fixed on the fore legs, and the foetus gradually comes away. By evacuating the fluid the skull collapses from external pressure, and no further impediment is offered.

Ascites (abdominal dropsy).—In this disease the foetus is possessed of a very large abdomen, as shown in Fig. 154.

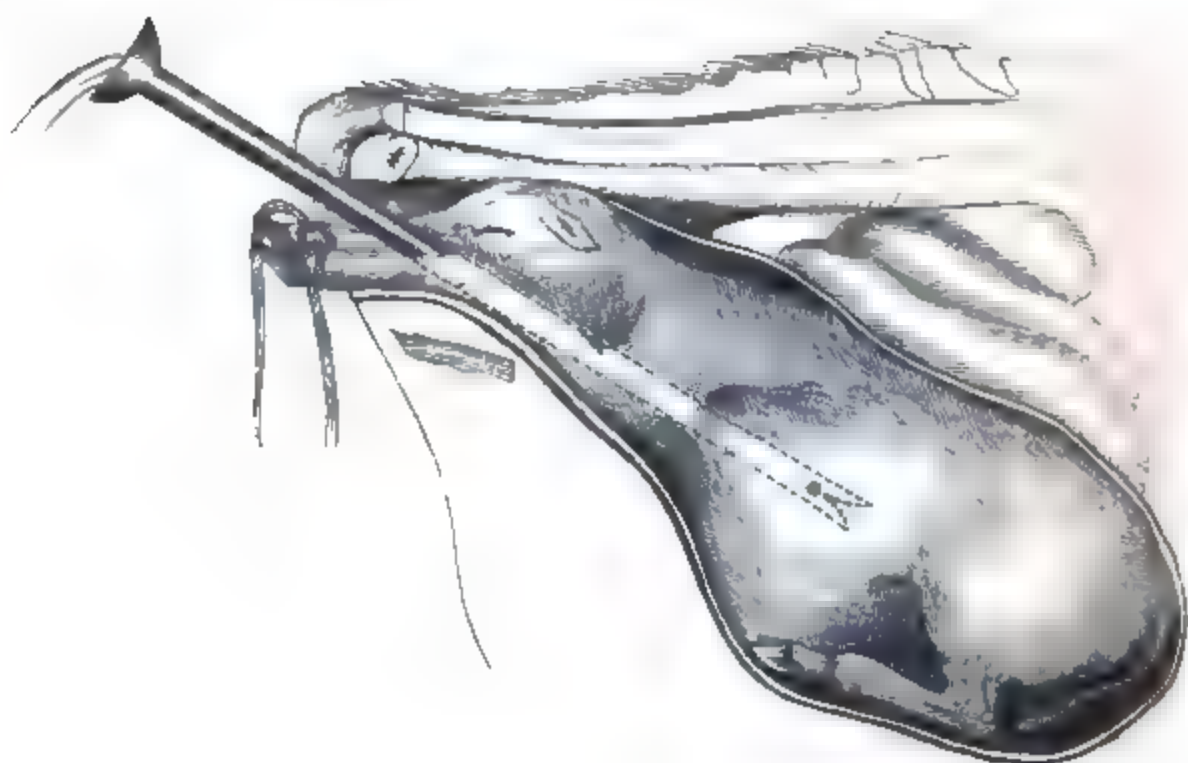


FIG. 154.

Usually the position is natural, but it may be of the most difficult kind.

The practitioner should first endeavour to reach the abdomen with a concealed knife (Fig. 155), the blade of which



FIG. 155.—*Concealed Knife.*

must be plunged through the parietes, so as to evacuate the fluid into the womb. If that process cannot be accomplished, a long trocar is used, which, being conducted between the fore legs of the calf, is plunged through the chest into the abdomen (Fig. 154); and on withdrawal of the stilette, water flows abundantly, after which delivery is effected in the ordinary manner.—*Ed.*]

POST OR AFTER-LABOUR PAINS IN THE COW, EWE, AND PIG.

[In the absence of causes producing anthracoid states in the different animals, each are liable to those which produce a

tendency on the part of the animal to strain violently, after parturition has apparently proceeded correctly. The usual efforts of the womb to contract are also frequently attended with the desire to strain, and the passage of the hand as a stimulus, or a little cold water injected up the vagina, will frequently complete the process.

Where parturition has been slightly protracted or assisted, search should be made for injuries inflicted upon the uterus, vagina, bladder, or each of these. The pulse and thermometer should be carefully studied, as lurking evidences of internal disease may be detected.

The retention of the membranes may prove the exciting cause, and efforts should be at once made for their careful and safe removal. In young cows having their first calf these signs are apt to arise without obvious cause; and in older ones during dry summers, when herbage is scarce and fibrous, or when food of an artificial and highly stimulating character has been allowed, straining not uncommonly comes on as a result of indigestion generally. Under these several circumstances a strict investigation of the causes should be made, and treatment adopted accordingly, laxatives being required in indigestion, and suitable dressings to injured parts.—*Ed.*]

TO EXTRACT THE PLACENTA OR THE CLEANSING FROM THE COW AFTER CALVING.

The extracting of the *secundines* or *cleansing* from the cow requires care and proper management, lest violence should be used in drawing the navel-string too strongly. If the cow has gone her natural or full time, there is not the least difficulty or danger in taking it from her by manual operation, provided she be put in a proper position; otherwise it will be impossible to take it from her without tearing.

Such persons as wish to remove the *placenta*, and to give

418 *Diseases of the Organs of Generation.*

the cow that ease which Nature requires after pains of this kind, should observe the following rules :

First, Let the cow be taken to a proper cow-house or hovel, *well littered down with clean straw*, as soon as possible after calving ; care must be taken that her fore parts stand on rising ground, or the ground before be higher than that she stands on behind. This will greatly assist the operator. Some cows will part with their cleansing with a little assistance while standing ; others will part with it much more easily when laid down. In either case the operator must take a towel, or a whisp of hay or straw, and lay hold of the umbilical cord or cleansing, and every time she attempts to strain draw it gently forward, if only for a few inches at a time, until you get it dislodged from its bed, and then it generally comes all at once.

There is but little chance of taking the cleansing properly away, unless every attention be paid to her throes or after-pains : we may assist Nature very advantageously ; but if we counteract her efforts, we expose ourselves to many disadvantages. Those cows which have slinked or slipped their calves before the regular time of gestation (and likewise such as have gone their full time, where the cleansing has been neglected to be taken away), in a few days become so tender that the least pressure upon it will cause it to tear.

[The membranes associated with the foetus, during the time it is within the womb of the mother, are known by the term *placenta* or *secundines*, and in agricultural districts and among cow-feeders generally as the *cleansing* or *after-birth*.

After the animal is born, no further office can be fulfilled by these membranes. They were the means by which blood—nutrition—passed from the foetus to the mother, and *vice versa* ; they also afforded provision for the accumulation of fluids around the young, which secured for it an almost entire immunity from shocks and other foreign influences that would otherwise have resulted in direct and even fatal injury. Their

retention may prove of great inconvenience after a time, from putrefaction, which is likely to ensue. Absorption of the products of that process from the surface of the uterine mucous membrane secures the establishment of a blood poison and putrid fever. No harm, however, may arise during a few days ; but their removal should not be delayed beyond that time, more especially if the signs of decomposition have arisen. Mechanical interference, from that state having commenced, may be required even at a much earlier period.

The causes of retention are various, among which debility, as preventing proper contraction of the uterus, is the most frequent. The quality of the blood may, in some instances, have something to do with the delay in obliteration of the utero-placental vessels, as certain states would imply. Long journeys by road, undertaken at or about the time of parturition, exposure to cold, bad food, and other debilitating influences, are also apt to interfere with their due discharge.

Medicines are sometimes given to assist the expulsion of the membranes, but these should not be allowed except as prescribed by a properly educated practitioner. The resorting to druggists and so-called chemists for preparations for cattle is more mischievous than productive of good, and in the absence of suitable advice on the point, let the farmer content himself with the administration of a pint of warm ale or elder wine.

In order to remove the placenta by mechanical means, the hand is first lubricated with a little rape, salad, or linseed oil, &c., and carefully passed up the vagina, through the *os uteri*, which may require dilating, into the uterus. In this operation the points of the fingers are first brought together so as to occupy as little space as possible, and the protruding membrane should lie beneath the hollow of the hand, the back of which is presented upwards on introduction. The placenta is held in the left hand, in order to make use of gentle traction at proper

420 *Diseases of the Organs of Generation.*

times, and an assistant holds the tail on one side. On entering the womb, the hand is passed to the several centres of attachment—the cotylædons—which are gently pressed between the fingers with a kind of rotatory motion, when detachment readily occurs. Violent movements must be scrupulously avoided, as hæmorrhage may result.—*Ed.*]

HÆMORRHAGE AFTER PARTURITION.

[The loss of blood which takes place after calving arises from two sources : the uterus and vagina.

Vaginal hæmorrhage is generally not of a serious character, exception being taken to the severe lacerations which sometimes result from violent throes in parturition in which a foot is the cause, or where hooks or knives accidentally wound from inability to direct them properly.

The colour of the blood is a bright scarlet, indicating that it comes from an artery. The stream is small, and trickles from the hairs terminating the pudenda (bearing), and coagulates rapidly. In some instances it is dark in colour, which may be attributed to the umbilical cord or navel-string being broken off within the womb or vagina.

The flow may be usually stayed in the first instance by cold water injections or astringent lotions. In the latter case treatment is seldom called for, excepting the passage of a ligature upon the cord, or, when the proper time has arrived, removal of the membranes.

Uterine hæmorrhage.—This form of hæmorrhage, commonly known as "*flooding*," is of a serious nature. The causes are injuries to the womb inflicted during the extraction of the calf, premature removal of the placenta, and other influences giving rise to debility of the organ, and from which the usual necessary contraction does not take place. It most commonly follows protracted labour.

The term *flooding* is derived from the form in which the blood is discharged, viz., in large quantities and with great force. The animal grinds her teeth, moans, and strains violently, with arched back and feet drawn together, and the blood is expelled in a semi-coagulated state. After this an amount of

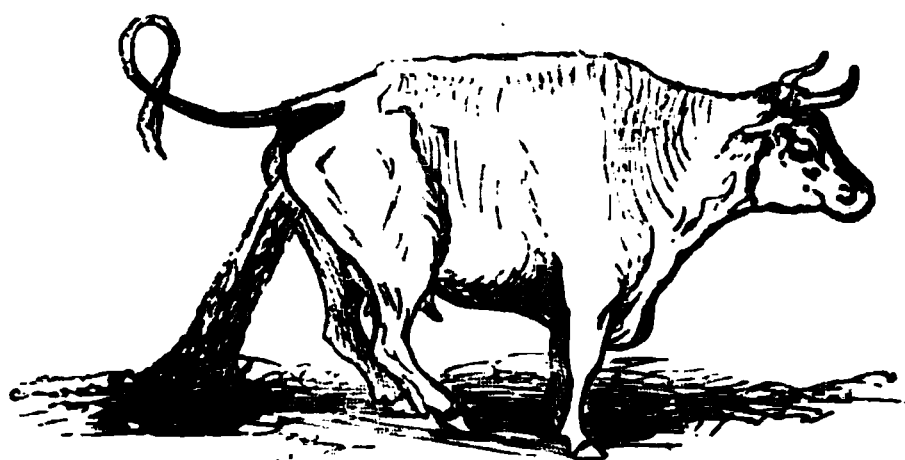


FIG. 156.—*Uterine Hæmorrhage.*

ease is obtained, and she lies down placidly for a time ; but as soon as an additional quantity of blood has again collected within the womb, further irritation arises, and the symptoms are reproduced.

The animal now begins to exhibit signs of dulness and prostration, and, if unrelieved, will sink and die from the loss of blood. The remedies usually applied are cold water injections to the womb ; sometimes, when the hand is passed up after being held in cold water, contraction rapidly follows, and the bleeding ceases at once. Cold water poured over the loins also proves serviceable, and when ice cannot be obtained, it is usual to dissolve about a pound of nitre in a pail of water, and *pour* it slowly over the back. Internal remedies consist of opium, turpentine, ergot of rye, tannic acid, catechu, kino, perchloride of iron, &c., &c., for the doses of which see Appendix. When severe prostration follows, stimulants, as brandy, whisky, ammonia, the ethers, &c., should be used.—*Ed.*]

422 *Diseases of the Organs of Generation.*

METRO-PERITONITIS—PUERPERAL PERITONITIS*— TRUE PUERPERAL FEVER.

[This affection is frequently confounded with *adynamia nervosa generalis*—nervous depression and parturient apoplexy (for which see pp. 119 and 459). It affects cows of all ages, and even ewes and sows, of whatever breed or condition, and follows difficult or protracted parturition, retention of the membranes, over-driving prior to parturition, and exposure to extremes of temperature. Bad milkers and cows in poor condition suddenly transferred to richer food at or about the time of calving, are not unfrequent victims.

Nature.—An erysipelatous inflammation of the uterus, and other abdominal organs, attendant upon parturition.

Symptoms.—The disease may occur within twelve hours after parturition, or it may be deferred to the third or fourth day. The most favourable prognosis may usually be formed in accordance with the lateness of the attack. All the signs are gradual.

First stage.—Capricious appetite, rumination probably suspended, diminished secretion of milk, restlessness with fever, extremities alternating in temperature, pulse rapid, full, and hard, injections of visible membranes, urine and fœces checked, animal temperature, as indicated by the thermometer, considerably increased.

Second stage.—Abdominal pains, as indicated by extreme restlessness, kicking at the belly, or frequent lying down and rising, sometimes remaining in the latter act upon the knees for a considerable period (Fig. 157). When down, the legs are

* To the late Professor John Barlow is awarded the honour of being the first veterinarian who clearly defined this affection. He spoke of it throughout his lectures (delivered in the Edinburgh Veterinary College as far back as 1850, in the writer's recollection) as "puerperal peritonitis," and thus separated it from simple "adynamia" and the "parturient apoplexy" of Professor Simonds.

being constantly drawn towards the body, and rapidly shot out again; the head is turned alternately to each flank when standing; pulse smaller and wiry; respiration accelerated,

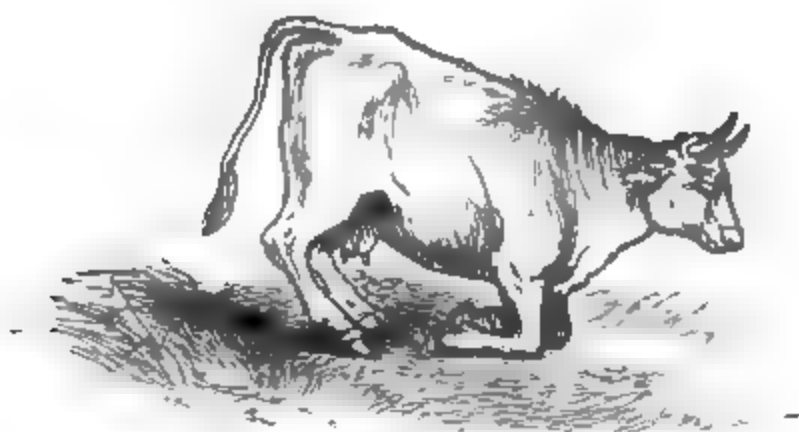


FIG. 157.—*Metro-Peritonitis.*

short, and confined as much as possible to the thorax; the abdomen is tucked up, constipation present, urine scanty and highly coloured.

Third stage.—Pulse small, feeble, and rapid, numbering 80 or 90 beats; the animal is more constantly down, or rises with great difficulty; pain increases within the abdomen; violent straining comes on; the rumen is distended from the formation of gas; she throws herself with extreme violence from side to side; at length becomes insensible (coma), and death rapidly follows.

Post mortem Appearances.—Inflammation of the womb (uterus), the veins of which are enlarged and turgid; lining membrane thickened—of a dark or chocolate colour frequently, and covered with a granular-looking kind of lymph. Large patches of extravasated blood are found throughout the peritoneum, while evidences of high vascular action are to be found in the various layers (mucous and sub-mucous) forming the different organs of the abdomen, most of which are involved. In the brain are evidences of congestion and ecchymosis as a result of blood poisoning in the last stage, but not of such acute characters as are found in parturient apoplexy.

424 *Diseases of the Organs of Generation.*

Treatment.—Great reliance must be placed on *early* bleeding, brisk catharsis, and reduction of the inflammation. With regard to the first of these measures, the quantity abstracted will depend greatly upon the age, size, and condition, with other peculiarities of the patient. The abstraction of blood in this, as in *all* other cases, must be regulated by the effect produced upon the pulse.

The purgative must be an active one, in order to overcome the severe constipation present. Such a form as before recommended is applicable here.

RECIPE NO. 137.

Take of Epsom salts	16 to 24 oz.
Calomel	I „ 2 drs.
Croton oil.....	15 „ 30 drops.
Ginger	I „ 2 oz.

Mix : give in two or three quarts of gruel.

Repeated injections of soap and water should follow, and the skin be called into action by friction alone, or cold sponging followed by dry rubbing and clothing. In two hours the following drench may be given :

RECIPE NO. 138.

Take of acetate of ammonia	4 to 6 oz.
Fleming's Tincture of Aconite	30 drops.

Mix, and give in a pint of warm gruel.

This drench may be repeated every four hours, reducing, however, the aconite each time five drops, until the quantity given amounts to ten drops. If the pulse is not then sufficiently acted upon, it may be continued two or three times, if great caution is exercised.

When the animal is observed in the later stages, and coma is present, a totally different treatment must be pursued. The abstraction of blood is more likely to kill the animal suddenly than otherwise. The purgative drench already detailed must be given, but the stomach-pump will be required for its safe administration. The animal cannot swallow, therefore the

medicine must be pumped into the stomach. Sometimes the probang is used, to which a funnel is attached, and medicine poured through it as a simple and ready proceeding.

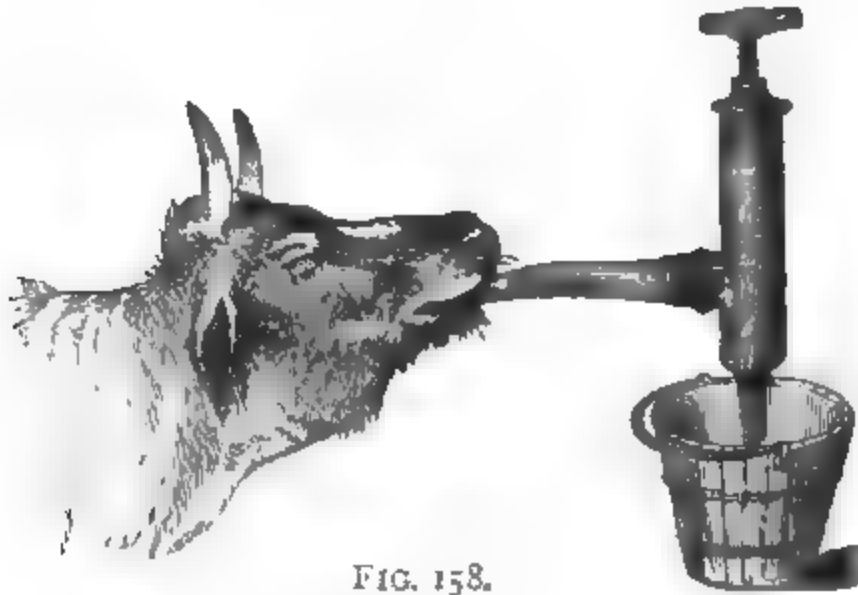


FIG. 158.

Injectons are constantly required at intervals of fifteen minutes, and it may be required to pass up twice or thrice in the day a medicated enema, such as the following :

RECIPE NO. 139.

Take of linseed oil	1 pt.
Croton oil	10 drops.
Soap and water	1 pt.

Mix, and allow it to remain in the rectum for half or three-quarters of an hour before other injections are given.

Purgation in very obstinate cases may be effected by the injection of a pint or quart of water (temp. 98° to 100° F.) into the veins by means of one of the instruments shown in Figs. 31 and 32, page 90 ; and when required, nervous power should be excited by the injection of solution of strychnine beneath the skin, by means of the endermic syringe, Fig. 30, page 90.

RECIPE NO. 140.

Take of pure strychnine	4 grs.
Spirits of wine	2 oz.
Sulphuric acid	6 drops.

426 *Diseases of the Organs of Generation.*

Inject 30 drops at intervals of half an hour, and increase or repeat the dose as required.

In those cases where pain obstinately continues, let belladonna be prescribed with the ammonia and aconite, or inject the tincture beneath the skin.

RECIPE NO. 141.

Take of prussic acid and tincture of belladonna, of each $\frac{1}{2}$ oz.

Mix: and inject thirty drops each half-hour, as circumstances admit, the pulse being carefully watched.

Blisters are of service to the abdomen, and may be applied as directed (page 240).

Favourable signs are return of cheerfulness, reduction of the pulse, establishment of normal temperature, loss of pain, action of bowels, plentiful urine of a lighter colour, &c. These, with returning strength, are tokens for the administration of such agents as will hasten the approach to convalescence. A common yet valuable form is the subjoined:

RECIPE NO. 142.

Take of infusion of quassia $\frac{1}{2}$ pt.

Gentian and ginger, of each 1 oz.

Mix, and give morning and evening in warm ale.

The remainder of the treatment consists of strict attention to all domestic arrangements, whereby comfort is induced, and moderate supplies of food, which should be of easy digestion.

Animals having recovered from this affection, and which calve properly under proper conditions at subsequent times of parturition, are not inevitably attacked. There are, however, peculiar dispositions in animals which ensure adverse states at these periods when exposed to certain influences. If more careful management characterized the many places where neglect now prevails, this affection might be greatly mitigated if not caused to disappear altogether.

Among sheep and pigs similar treatment is called for, according to the several stages in which the animal is found.

The doses of each mixture given will, however, require to be about one-sixth or one-eighth, as required by size, &c.—*Ed.*]

INVERSION OF THE VAGINA (*Prolapsus Vaginae*).

[In consequence of some irritation of the generative organs, probably injury received during parturition, the presence of tumours in the womb-passage, staining or after-pains, &c., the vagina is inverted or turned inside out. We have frequently observed the affection as a result of slinging animals for some injury or fracture of the extremities, when too much weight is taken off the legs. Those affected with œstromania are occasionally seized as a result of disease of the ovaries or female testicles.

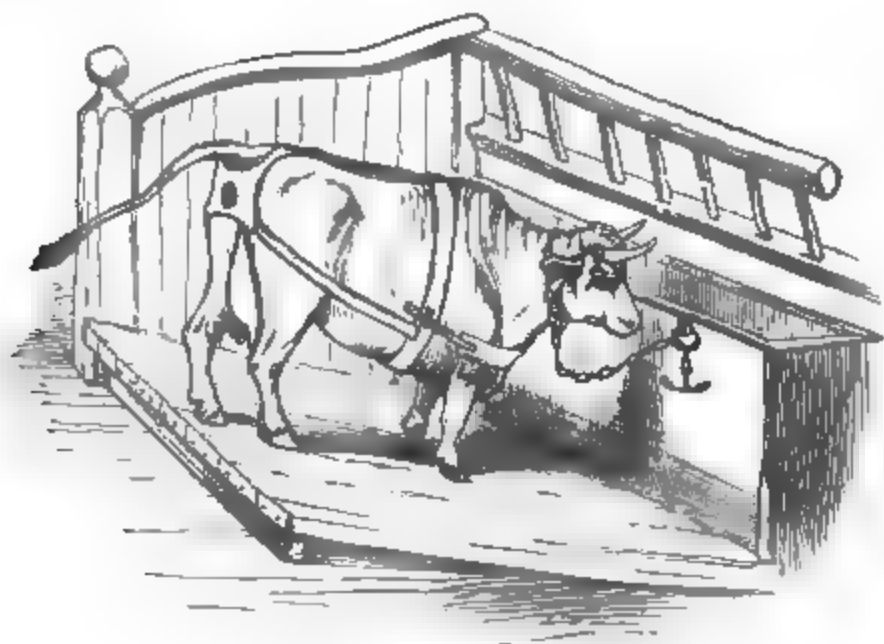


FIG. 159.—*German method of Securing a Cow to prevent Inversion of the Vagina, &c.*

Return is affected by similar means as was described under "Inversion of the Bladder." The appearances are here different to that form of inversion, the protruding organ being larger, of a deeper colour, having a central depression corresponding to the original passage, and upon the lower side can be detected the urino-vaginal opening to the bladder. The

428 *Diseases of the Organs of Generation.*

animal should be placed in a stall with the hind legs raised by means of litter, and the operator, with greased hands, exercises gentle pressure upon all parts of the organ at the same time by means of spreading the fingers round it. The central part then is to be gently pushed inwards by means of the thumbs, when the return is usually effected without much trouble. The nails should be short by previous paring, to avoid wounding the membrane, and pressure carefully applied, as in all probability the swelling is caused by the bladder or intestines, which are encased in the walls of the passage; therefore rupture must be avoided.

It may be necessary to bleed plethoric animals, or administer large doses of opium, belladonna, &c., to allay the straining, warm fomentations to cleanse and reduce the swollen parts, with external dressings of opium, or astringent lotions, &c. The practice of placing stitches through the vulva (shape or bearing) is to be condemned as an additional source of irritation. A truss or harness is sometimes worn, which is also shown in Fig. 159, and proves a more serviceable proceeding.—*Ed.*]

[INVERSION OF THE WOMB (*Prolapsus Uteri*), commonly known as] *The Falling Down of the Calf-Bed.*

This is a complaint, or rather an accident, of frequent occurrence among old cows at the time of calving, and proceeds from the violent motions that attend the extracting of the calf, and likewise from the relaxation of the ligaments of the uterus. Some cows are more subject to the falling down of the calf-bed than others; this appears in a great measure to proceed from the shape and make of the cow in those parts. The cows most liable to this complaint are those that rise considerably on the small of the back, in form of a curve, and begin to lower towards the tail: the hips, rump, and sirloin are for the most part straight. Cows made in this form denote great

weakness in those parts; and, without care and proper management at the time of calving, are almost sure to have this complaint.

[Doubtless a predisposition occurs in some animals either caused or accelerated by a tendency to tuberculosis; constipation is a fruitful source, and distension of the rumen an awkward complication. Injuries also inflicted upon the womb or vagina, or their internal attachments, during assisted parturition, frequently bring on this untoward state.—*Ed.*]



FIG. 160.—*Inversion of the Womb.*

The observance, however, of the following rules may prove a means of preventing it.

I. If they are kept in a cow-house at the time of calving, the floor or pavement should be on a level: it would be greatly to the advantage of some cows to stand *higher behind* than before for a considerable time before calving, as it would enable them, when down, to rise with more ease, and with less danger of straining themselves.

II. If the falling down of the calf-bed be suspected, the cow ought to be carefully watched at the time of calving, and, as soon as that takes place, care should be taken to have in readiness a clean sheet to put underneath and around the calf-bed, if she lay down, or to support it if standing, and likewise to protect it from particles of dirt or straw adhering to it, as also from the effects of air.

430 *Diseases of the Organs of Generation.*

Then let the operator take away the placenta or cleansing in the gentlest manner possible, lest an effusion of blood take place, and endanger the life of the animal. Afterwards bathe and wash all the parts that hang down from the uterus with the following lotion :

RECIPE NO. 143.

Take of rectified spirits of wine	8 oz.
Camphor, sliced	1 ʒ

Dissolve the camphor in the spirits, then add

Goulard water	4 „
And soft water	1 qt.

Mix altogether, and when used let it be made new-milk-warm.

As soon as the parts have been well washed or fomented with this lotion, her hind parts must be sufficiently raised, and the person's hand well rubbed over with linseed oil. Then endeavour to find the middle part of the calf-bed, and by the gentle pressure of the hand it may in general be replaced with ease and safety.

[Great care is required in this operation. The closed fist is usually placed upon the central part of the womb and pressed forwards into the passage, avoiding the tendency to oppose by forcible resistance the throes of the animal. The operator must be satisfied if he can maintain his position from time to time, and make an advance between the efforts to strain. Forcible resistance has been known to rupture the womb.*

As the womb gradually enters the passage, assistants should endeavour to afford aid by pressing in the organ round the arm of the operator, which must not be retracted until the organ is properly returned. If the throes are very powerful, and danger of rupture is threatened, a powerful antispasmodic should be given.

* Rupture of the womb is known by the sudden cessation of all efforts on the part of the animal, rapid prostration, running down pulse, and decline of animal temperature, &c.

RECIPE NO. 144.

Take of chloric ether	1 oz.
Laudanum	2 „
Ale or porter (cold).....	1 pt.

Mix, and repeat in one hour if required, or the prussic acid and belladonna mixture, No. 141, recommended at page 426, may be injected beneath the skin.

Return of the womb should be effected as quickly as possible after inversion, as there is great danger of strangulation occurring from pressure of the neck. If the parts are cold and purple, pulse small and feeble, or approaching indistinctness, the womb must be amputated, or the animal cannot be saved. The flesh of cows after suffering from this affection is decidedly unfit for human food.—*Ed.*]

Sometimes it is with difficulty prevented from falling out a second time. When this happens, take a small wire and pass it through the lips of the womb, and bend each end of the wire, in order to prevent it from falling out. This may be permitted to remain there several days, or until such time as the calf-bed gets properly fixed in its former situation. This will easily be known by the animal having no more symptoms to strain herself, after which the wire may be taken away.

[A more reasonable and effectual plan is to make use of the harness, as shown in Fig. 159, page 427. Stitches through the bearing are sources of great irritation to some animals, and should be avoided when a suitable truss can be procured.—*Ed.*]

As soon as the calf-bed is properly replaced and made secure (if no antispasmodic medicine has been already administered), it will be necessary to give her the following drink, which will be found of excellent use in removing those violent after-pains to which cattle in this state are liable :

[RECIPE NO. 145.

Take of chloric ether	1 oz.
Extract of belladonna	2 drs.
Water	1 pt.

432 *Diseases of the Organs of Generation.*

Rub the extract with a portion of the water until it forms a thick fluid; afterwards add the remainder, and, lastly, the ether. Repeat if necessary in two hours.—*Ed.*]

VAGINITIS—VAGINAL CATARRH.

[Inflammation of the vagina, or womb-passage, is not uncommon after severe and protracted parturition; but the usual form in which it is observed occurs some time afterwards, and is ushered in with a shivering-fit, frequent pulse, general signs of fever, constant and painful attempts to pass water, &c. The walls of the passage are swollen, inflamed, and tender, and shortly a glairy mucous flows, which eventually becomes thick and white (purulent). In those animals that have been badly kept, and others of extreme age, or otherwise debilitated, the discharge is apt to become very copious, and continue for a length of time, assuming chronic characters.

Treatment.—Administer gentle purgatives, with subsequent sedative medicines. Wash the affected parts with warm water, or use fomentations, and afterwards lotions of zinc, &c.—*Ed.*]

LEUCORRHŒA, OR THE WHITES.

[A chronic discharge issuing from the membrane of the vagina and womb, composed of mucous, or mucous and pus (muco-purulent), is known by the above term. The causes are frequently those of a debilitating character, and the disease is often associated with a scrofulous state. There are no signs of attendant fever; and the mucous membrane, as seen by separating the lips of the vagina-vulva, is pale, and covered with a thick white or grey discharge, which hangs from the vagina in shreds, and accumulates upon the tail and all surrounding parts. In a week or two the secretion becomes

darker coloured, sometimes yellow, at others greenish, and has an offensive odour, but observes no regularity in the amount. The pulse is small and feeble, and the membranes of the nose and eyes are pale, mouth clammy, appetite capricious and sometimes absent, rumination suspended, and gradual wasting ensues. These animals are apt to become affected with *nymphomania* or *æstromania*, commonly known as “bullers,” or having a constant desire for the male, yet rarely become pregnant, or if they do are almost certain to abort, and exist as a terror and nuisance to the stock-breeder. In some instances the period of *æstrum* or heat does not appear, and general emaciation progresses until tubercular consumption is fairly established, or diarrhœa carries off the animal.

Treatment consists of employing a nutritious yet laxative diet, and the administration of tonic remedies. The following is frequently valuable :

RECIPE NO. 146.

Take of spirits of nitric ether	2 oz.
Extract of tarraxacum	$\frac{1}{2}$ „
Infusion of quassia	$\frac{1}{2}$ pt.

Mix, and give morning and night ; or the following :

RECIPE NO. 147.

Infusion of quassia	$\frac{1}{2}$ pt.
Solution of perchloride of iron.....	30 drops.

Mix : administer morning and evening ; but if diarrhœa supervenes, No. 146 may be substituted.—*Ed.*]

[GONORRHŒA—CLAP—commonly called] *Bull-Burnt*.

This is a local disease affecting the sheath of the bull. The parts become foul, and full of cancerous ulcers, which inflame the bull's yard or penis, and cause the sheath to swell.

[The *Symptoms* of this affection are very characteristic. Bulls and cows suffer considerable pain in urination, which is

434 *Diseases of the Organs of Generation.*

frequently attempted, while only a few drops are voided ; the tail is lashed from side to side ; much uneasiness prevails ; the hind legs are frequently raised, and the sufferer stamps and repeatedly moves from side to side, sometimes moaning and grinding the teeth. The pulse is accelerated and full, and bowels are sometimes constipated. At first the discharge is slight, but tumefaction is great. At length the parts swell and are of a deep red colour. Eventually the discharge becomes thick, white, and corroding ; and, in neglected cases, the membrane is divested of its epithelium, ulcers or chancres appear, and a bull may become totally useless from the formation of sinuses in the penis, terminated by a large tumour, which calls for amputation.

Animals affected with gonorrhœa should not be allowed to copulate, as the disease is communicated, and the previous sufferer endures greater aggravation. In the treatment, care must be exercised in the use of remedies : all strong and powerful agents must be used in great dilution, and increased gradually as the disease advances. Chancres must be touched with lunar caustic, and warts excised by the knife. A dose of laxative medicine should be given, and careful domestic treatment enjoined.—*Ed.*]

The most effectual way of curing this disease is to throw the bull down and turn him on his back, with his belly upwards. Then take a linen cloth and fold it round his yard, and gently draw it out of the sheath till you can see to examine all the ulcerated parts, which should be bathed and washed with the following lotion :

RECIPE NO. 148.

Take of camphorated spirit of wine.....	4 oz.
Sugar of lead	1 „
White vitriol.....	2 „
Soft water.....	1 qt.

Mix, and keep them in a bottle for use.

The bull should be dressed twice a week with this lotion,

and kept from bulling cows until well. Care must be taken, every time he is dressed, that *every part is properly washed or bathed with the mixture*. Or he may be dressed in the same manner with the following mixture, which is more powerful :

RECIPE NO. 149.

Take of sugar of lead, white vitriol, blue vitriol, and	
bole armenic, of each	$\frac{1}{2}$ oz.
Boiling water	1 pt.

Mix, and when new-milk-warm, put them in a bottle for use.

This is a very powerful mixture, but should not be used the first time of dressing ; afterwards it may be used with safety.

The *matrix*, or *womb* of the cow, is sometimes affected by the bull, which causes the parts to inflame and swell, likewise to discharge a disagreeable ichor ; at the time of staling she appears to have considerable pain. All the parts that appear to be infected must be bathed with the lotion (No. 148), the other being too strong for the cow ; and a linen rag may be soaked in the lotion, folded round the finger, and introduced into the womb, or injected up with a syringe. A few dressings will in general be found sufficient.

[MAMMITIS—MASTITIS or GARGET : *the so-called*] DOWN-FALL IN THE UDDER OF COWS, known also by the name of *Sore Ulcers*.

This is a disease of the utmost consequence to the owners of neat cattle. Young cows in high condition are the most liable to it, especially at the time of calving. Such as are more aged are the most subject to it during hot and sultry weather, particularly those which are fattening for the shambles. When this is the case the loss is considerable, a summer's keep being generally thrown away, to the loss and disappointment of the owner.

Cows of a gross habit of body, when over-heated, or when

436 *Diseases of the Organs of Generation.*

they have taken cold, are very liable to it at all seasons. This disorder makes its appearance in an inflammatory tumour, collected from a gross habit of body, and deposited upon some part of the lacteal vessels, where its presence is quickly discernible by lessening the quantity of milk, and changing it to a ragged, bloody, and corrupt appearance. At other times the milk or corruption is totally stopped, and the tumour gradually increases to a state of suppuration.

[Inflammation of the udder arises in many instances from the effects of lying upon cold stones or wet grass, when the system is susceptible of external influences by reason of recent parturition. Bruises, wounds, and other sources of injury, are not uncommonly productive of mammitis, as well as the absurd practice of leaving portions of milk in the udder, instead of carefully abstracting the whole at each milking, which proceeding is known as "hefting;" with the equally injurious one of allowing the udder to go too long without milking, as is seen in almost every market in Britain.

Mammitis also accompanies other diseases, and is not unfrequently seen in "drapes," or cows giving no milk. Rheumatism is a common accompaniment.

Symptoms.—A shivering-fit is usually observed in the first instance, which is soon followed by considerable fever and dullness. The bag becomes hot, swollen, and tender, milk decreased, bowels constipated, and the animal is averse to having the operation of milking performed.

These signs subside somewhat, but the udder becomes painfully hard in one or more parts, resembling internal tumours, and continues swollen. The milk extracted is curdled, and frequently blood is found in it.

Shortly these hardened parts become soft and fluctuate; pus is present, and probably discharged with the scanty portions of milk. At other times, the abscesses suppurate externally; or, the disease stopping short of suppuration, the

bag or quarter remains hardened or indurated, and no longer capable of giving milk.

Treatment.—Simple mammitis in the first stage is amenable to treatment; after that, much trouble is involved and disappointment contracted. Let the animal be attended to at once. Supply a good bed, and shelter from cold and wet. Administer a purgative, as—

RECIPE NO 150.

Take of Epsom salts	1 lb.
Ginger	1 oz.
Treacle	1 lb.
Warm ale.....	1 qt.

Mix.

Next institute fomentations, which should be applied incessantly for three or four hours, and at the close let a large hot poultice (110° to 115° F.) be ready for application to cover the whole udder, and support it by means of a broad bandage over the back, as shown in Fig. 162.



FIG. 162.—*Method of Supporting the Udder.*

If the constitutional disturbance continues, use the aconite mixture given at page 235, in accordance with the directions. Open abscesses as soon as possible, and dress the wounds with



FIG. 163.

lotions, as enumerated at page 402. Draw away the milk by means of the teat syphon (Fig. 163), and use injections of weak solutions of carbonate of soda or potash, by means of the

438 *Diseases of the Organs of Generation.*

glass syringe (Fig. 18), held lightly and carefully, as shown in Fig. 164.

The addition of two or three drams of extract of belladonna to the poultice is frequently conducive to a favourable termination in the early stages. When portions become hardened, the following ointments may be used, with smart friction :



FIG. 164.—*Method of injecting Fluids into the Milk Gland.*

RECIPE NO. 151.

Take of soft soap	$\frac{1}{2}$ lb.
Mercurial ointment	1 oz.
Camphor ointment.....	4 „
Extract of belladonna	4 drs.

Mix, and apply once a day ; or

RECIPE NO. 152.

Take of tincture of iodine.....	6 oz.
Tincture of opium	2 „
Soap liniment	4 „

Mix, and apply with friction two or three times a day. It may be also advisable to give the following internally morning and evening :

RECIPE No. 153.

Take of iodide of potassium	2 drs.
Gruel	1 pt.

Dissolve.

In all cases the milk must be drawn regularly and effectually, and where practicable, and the inflammation is not great, the calf may be put to suck. Sometimes, when the udder is hardened in one or more quarters, dry friction will cause it to become softer ; but care must be excised in order not to excite a fresh inflammation.

The milk, during this disease and the application of the

Inflammation in the Udder of Ewes. 439

foregoing remedies, is not suitable for human consumption, and in advanced cases of abscess should even be avoided for pigs and calves, &c.

Mortification is sometimes a result of mammitis. One portion of the udder, or it may be the whole of it, assumes a dark hue, with a circumscribed margin of a bluish red colour. The diseased portion becomes still darker and shrivelled, and at length, if the part is pulled, it will come away altogether. When this happens the system must be supported, and occasional laxatives given; the parts must be separated as soon as possible, and one of the lotions enumerated at page 402 applied as desirable. Animals suffering from this stage should be removed from all others, particularly pregnant ones, as great excitement will be produced by the odour of decomposition, and probably abortion instituted.—*Ed.*]

INFLAMMATION IN THE UDDER OF EWES.

This is a common complaint among ewes at the time of yeaning or lambing. Those which have been well kept for some time before they bring forth are the most liable to this complaint, as it is apt to cause a flush of milk at that time; and from the glutinous state of the first milk, and also from being long retained in the udder, it blocks up every passage, and soon brings on an inflammation in that part, unless proper care be taken to *prevent* it.

All ewes at the time of *yeaning* ought to have their udders well examined by the shepherd: if their milk pass freely from them on pressure of the finger and thumb, there is but little danger of an inflammation in those parts. On the contrary, if the udder be *tumefied*, and there be found no passage for the milk in its regular channel through the teats, these parts being completely glued up with the glutinous quality of the first milk, it is frequently found necessary to introduce a small knitting-needle up the regular passage into the udder (but this requires

440 *Diseases of the Organs of Generation.*

proper care and attention lest a new passage be forced) ; after which the milk may be discharged with ease.

[RECIPE NO. 154.

Take of soft soap 2 oz.
Extract of belladonna 2 drs.

Rub together in a mortar, and add

Spirits of wine $\frac{1}{2}$ pt.

Mix ; and keep in a tightly-corked bottle for use morning and evening.

When indurations take place, use the ointment No. 151, or liniment No. 152 ; or, if preferred, the following—*Ed.*]:

RECIPE NO. 155.

Take of oil of olive 4 oz.
Spirit of turpentine..... 2 „
Soft soap 1 „
Camphorated spirit of wine and spirit of hartshorn,
of each 2 „

Mix them in a marble mortar with the soap, by a little at a time, and then put them in a bottle for use.

After the milk has been drawn from the udder, or at least all that can be taken away at the present time, rub in the above oils on the part affected, and let this be done *twice a day*. They will be found of excellent use in all purposes of this kind, where obstructions are formed in the lacteal vessels. But if the tumour should increase and proceed to a state of suppuration, it will then be necessary to open the part with a lancet or a sharp-pointed knife, and then to dress as directed for wounds.

The treatment required in this affection in ewes and sows is mainly of the same character as directed under “Mammitis” in the cow.

A further and more exclusive discussion of the maladies incidental to the organs of generation will be undertaken in a work specially devoted to the subject, and which is nearly ready for the press.—*Ed.*]

SECTION VII.
DISEASES OF THE NERVOUS
SYSTEM.

DISEASES OF THE NERVOUS SYSTEM.

[There is no department in veterinary medicine in which the practitioner is frequently at such great loss for data for reliable action, as in the nervous disorders of the lower animals. Whether they be of the functional or structural class, he is almost powerless in many instances from a variety of causes. The small acquaintance which non-professional persons have with these admit of their being frequently overlooked in their early and recoverable stages, and a variety of events operate against the cultivation of knowledge by the investigation of causes. We may hope to see ere long that the efforts of the Royal Agricultural Society of England, advised as they are by the eminent counsel of Professor Simonds, the laudable movement by the Highland and Agricultural Society of Scotland, in their resolve to establish a chair of Cattle Pathology in the Edinburgh Veterinary College, and, lastly, we must not forget the connection of Professors Simonds and Brown with the Veterinary Department of the Privy Council, will be manifest in the direction in which their operations are intended to be confined. The nature of many of the ailments of cattle require greater scope for investigation, and the history of some requires to be written. The movements are in the right direction; the question is a public one, and the patronage of influential bodies like those named is likely to prove immeasurably beneficial.—*Ed.*]

[PHRENITIS or] INFLAMMATION OF THE BRAIN.

This disease is one of the most distressing to which cattle are subject, and is commonly called by the name of "Frenzy" or "Sough." It is most prevalent during the hot months in the summer season. It is sometimes idiopathic, or a primary disease, at other times it is symptomatic. Inflammation of the brain proceeds from some other malady, as fevers of a different kind, or from an inflammation taking place in some particular part of the body, and which is transferred to the brain. The cause is too great an efflux of blood pressing upon the temporal arteries, from which an increased action of the vessels takes place. The symptoms that usually precede a true inflammation of the brain are a kind of madness, attended with ravings and constant watchings, slow respiration, and a strong pulsation in the temporal arteries. The animal appears in a very fierce state, as if seized with a turbulent kind of madness. The eyes appear much inflamed and ready to start from their orbits; the beasts often fall down of a sudden, and rise again with the same volatility, until nature is quite exhausted; a constant trembling and starting of the tendons, a dry and harsh skin, a suppression of the urine, grinding of the teeth, and a total want of rest. These last are unfavourable symptoms.

The frenzy or inflammation of the brain is sometimes occasioned by wounds or contusions in the head, that are attended with violent inflammation of the vessels, and if not speedily relieved may terminate in a gangrene or mortification, which is very often the case, and that in a few days.

[Phrenitis is not common among cattle as an idiopathic affection. The frequency with which it has been said to appear has arisen from the signs of delirium consequent upon acute indigestion or impaction of the omasum, and that form which ensues from lead poisoning being confounded and described

as such in many works on the diseases of stock. Fortunately, mad cattle are rare.

Treatment consists of the administration of a brisk cathartic (page 424), and assist its action by clysters. Blood should be abstracted from the jugular vein while the pulse is full and strong, and the head cooled by applications of ice or cold water. As the limbs are liable to become cold, mustard or strong ammoniacal embrocations are beneficially applied. Rapid purgation by the injection of water into the jugular vein, as detailed at page 129, or the endermic use of aconite, may afford more speedy relief. Similar remarks apply to the alleged affection among sheep and pigs: apoplexy and succeeding coma as a result of plethora and indigestion being mistaken for this disease.—*Ed.*]

APOPLEXY.

[We have referred to a form of apoplexy among cattle as an attendant upon parturition and acute indigestion, but, purely as an affection of the nervous system, it is very seldom observed. Writers have described signs under the term; but there is reason to believe that the brain affection noticed is but symptomatic of stomach disorder. In other instances, the disease "Blain" has been confounded with it.

When apoplexy proper appears, the signs are rapidly developed, the animal drops paralysed, unconsciousness takes place, and terminates fatally in nearly every case. The disease does not admit of easy recovery, as stated by some, in higher rates than one or two per cent. After death blood is discovered to have escaped from the vessels, and become effused over the lesser brain, *medulla oblongata*, and superior surface of the spinal cord. The lesions in this affection are quite as severe as in the symptomatic affections referred to.

Among sheep and pigs the disease is of seldom occurrence; and the writer is almost constrained to view those cases that

have been described as pure apoplexy in these animals as well as in cattle to arise from remote causes, as plethora, inducing a blood poison or acute indigestion tending to the same end. A form of apoplexy in pigs has been already described under "Blood Poisons."—*Ed.*]

EPILEPSY.

[Cattle and sheep, as well as pigs, suffer from this affection, but the latter animal may be said to exhibit the greater liability to it. Up to the present, little light has been thrown on its nature further than that it depends upon some peculiar morbid condition of the nervous system, probably arising from defective nutrition. Epileptic seizures are common to young animals generally, but they occur also in others as a result of blood diseases, ordinary poisoning, &c.

Symptoms.—These mainly comprise severe convulsions, with coma and foaming at the mouth. Among the animals mentioned above, the signs are probably witnessed to greatest advantage in the pig.

Apparently well at a given time, and without any previous manifestations of disorder, the pig, if standing, is observed to



FIG. 165.—*Epilepsy.*

stagger, the eyes protrude and are staring, and violent champing of the jaws commence, with foaming at the mouth (Fig. 165). The animal drops on his haunches, and the fore limbs are rigid; the head is elevated and turned from side to side, and jerked upwards; the muscles of the body are also convulsed; urine and fœces are passed involuntarily; the tongue is

bitten and sadly bruised; and at length the creature falls, violently struggling, and in a state of entire unconsciousness. The heart-beats are strong and violent, and visible membranes are increased in colour. Sometimes lengthened sleep follows

an attack ; at others, the animal quickly regains consciousness, but to suffer speedily ; and after several attacks, dies in one of them.

Treatment.—This is most unsatisfactory. Assuming the affection to have no other origin than purely a nervous disorder, belladonna or atropia appears to be indicated. If that abnormal action can be traced to the presence of worms, their eradication should be provided for. The writer has frequently met with cases in which worms in the stomach and intestines of animals have given rise to epilepsy ; and, doubtless, in many of the obscure cases in which slight diseases of the blood-vessels (*atheroma*) have occurred, the cause may be centred in the passage of the minute ova of parasites along the circulation, which, interfering with the flow of blood, gives rise to the lesions referred to.

Epilepsy is rarely recoverable. Good food, proper housing, and opportunity for exercise are essentially required. At the period of attack little can be done. The dashing of cold water over the head and face is the most proper course, and other measures should be deferred until the seizure has passed. Afterwards, existing irregularities may receive attention, and their removal attempted.—*Ed.*]

HYDRO-RACHITIS, OR LOUPING-ILL.

[Throughout the lengthened category of the ailments of animal life, there is probably no form of disease more interesting to the pathologist and sheep-breeder than the affection we are about to consider under the above title—to the first in a scientific as well as utilitarian point of view ; and to the second, as a pecuniary question and one of successful stock management. As these facts become more apparent, it is probable further opportunities for investigation may be afforded and promoted, and the results prove of mutual and inestimable benefit.

Hydro-rachitis is observed in animals of different ages, and the following detail must be accepted as applying to sheep, lambs, and pigs.

The *Causes* of this malady are somewhat obscure. A great deal doubtless depends upon the modification which grasses and various herbage undergo upon different estates, as a result of peculiar geological characters. Added to these are doubtless the effects of cold, exposure, influences of extreme variations in temperature, and probably also of the water supply. It is very singular that animals in certain localities never suffer except when confined to one particular pasture; in other districts the disease is never seen. Again, the malady may disappear for several years, and suddenly again commit serious losses. An instance of this character was recently brought under the notice of the writer. About five or six years ago, this disease disappeared from a farm where it had affected the lambs principally for many seasons previously with regularity and severity. The farm-bailiff thought he had gained a mastery over the malady, or that "it had worn itself out." The lambs are always early on this estate, usually dropped in January and February; and this year, strange to say, the pest was renewed with more than ordinary intensity and prevalence—in fact, every lamb was affected. The principle of farming is good, but not to be considered of a high character; and what is more remarkable, a complete change of system took place a few years ago, the farm being no longer used for first-class stock breeding, but as an arable farm principally, a small flock of sixty or seventy ewes forming the greatest bulk of live stock.

Symptoms.—In adult animals the first signs of disorder are confined to the nervous system, which is manifest in irregular movements, with evident weakness, when the animal suddenly falls, and suffers from extreme convulsive movements. Paralysis rapidly advances, which is known by the shepherds as being

"weak," or "taken across the loins." One side is usually more affected than the other, and it is not long before the animal loses all power over the hind limbs, which, twisted and flat upon the ground, are dragged about as much as the animal is able in search of food. Death, however, takes place in some cases within a few days, owing to the acute nature of the attack and emaciation that ensues from the disease, as well as a want of food. In chronic or protracted cases the signs are developed more slowly, and are perhaps not so severe, entire control over the hind limbs not always being lost.



FIG. 166.—*Hydro-Rachitis.*

The appetite is usually of a depraved character, and the desire for food may approach to voracity; foreign bodies, as stones, dirt, sand, &c., being greedily swallowed, along with the grass eagerly torn from the ground. Towards the close the eyes are staring and amaurotic, animal temperature low, and urine as well as fæces discharged passively.

Post mortem Appearances.—These are confined to the nervous system principally, and digestive organs. The spinal cord is usually more or less vascular than in health, and there is an increase in the quantity as well as consistence of the fluid by which it is surrounded. The ventricles of the brain also contain similar excesses, and softening of the cord is not uncommon. In the stomach—chiefly in the first and second compartments—are earthy matters, hair-balls, and lumps of matted wool; but the quantity of ingesta greatly depends upon the condition of the bowels before death.

Treatment.—This is of two kinds, *preventive* and *remedial*. When the disease has appeared in lambs at their birth, it is due to a want of vigour on the part of the ewe. A dry summer succeeded by a wet, cold autumn, should point out the necessity for greater care in the sheltering and supply of sound food. The birth of lambs and young of any kind is materially influenced by the condition of the mother, and from debility existing in her, the nervous system of the young is most likely to suffer. Older animals should be placed on improved lands. The old grass of unimproved and unalterable ground may be grazed by horses, but avoided for sheep and pigs. Rock salt or common salt placed in suitable covered receptacles should be judiciously supplied.

Remedial treatment is rather a difficult matter among a great number of affected animals, and the want of more attention individually militates against success. The remedies consist of nitre, digitalis, acetate of ammonia, aconite, sulphate of potash, iodide and bromide of potassium, nux vomica, &c., in small and repeated doses, combined with care, attention, and good food.

The more obscure causes require attention, and the agriculturist would do well to foster a desire to investigate them. It is not to be supposed that the mystery in this and other equally obscure and important maladies will be cleared up at once and with rapidity. A combined effort is required, in which agriculture and veterinary science must work patiently side by side, when success must be certain.—*Ed.*]

PARALYSIS—PARAPLEGIA—HEMIPLIGIA.

[*Paralysis* or loss of power—which is further described as *paraplegia* when the whole of the fore or hind part of the body is affected, and *hemipligia* when one side or lateral half has lost its power of voluntary movement—rarely occurs as a dis-

tinct affection. It occurs from an apoplectic state of different portions of the cerebro-spinal system and the result of injuries, but generally is observed as a symptom of other diseases, when it may arise from absolute pressure, softening, effusion of fluid (serum), as already described under "Rachitis or Louping-III." In the apoplectic form, death usually follows rapidly.—*Ed.*]

RABIES—HYDROPHOBIA.

[It is not the intention at this time to enter into a consideration of the various arguments bearing upon the causes, nature, and origin of rabies that have been adduced, and tended to render confusion doubly confusing. We can only deal with it here as it occurs in the animals whose maladies are recognized in the work.

Rabies, or madness, like many other diseases in which the nervous system is involved, possesses most occult characters; and, although the pathognomic signs are violent and frightful to behold, the least information is derived in *post mortem* examinations of a character to throw light upon its real nature. Observation under other conditions have furnished reliable data, and these we propose to advance regarding it. The most prominent feature (because at once the most dangerous and terror-striking) is its acknowledged contagious property, and communicability by inoculation to man and other animals. Rabies is not spontaneous in, or specifically common to, the ox tribe, sheep, or pigs. When it appears in them, it may be safely traced to inoculation from the bite of an affected dog.

The *Symptoms* of rabies, as well as evidence of its nature, period of incubation, and highly contagious properties, will be rendered more apparent by the records of a number of cases that came beneath the personal observation of the writer about three years ago.

A rabid dog had been taken by a groom ignorant of the

affection, and imperfectly secured by a chain to the ring of a manger in a building where a number of calves and sheep were confined. During the night he broke loose, and repeatedly bit several of the animals. A goat among the number escaped by jumping upon some empty packages at a considerable height beyond the reach of the dog, and a small calf was protected by creeping beneath the manger, in front of which larger animals were tethered, and exposed to the fury of the rabid creature.

Of this number four calves and two sheep were bitten on the first of the month: one of the calves sustained a compound fracture of the fore-leg, and was destroyed; the remaining three calves and two sheep were kept for observation. Nothing of note occurred up to the 23rd of the month, when one animal (a calf) exhibited an inordinate desire for water, but experienced a difficulty in swallowing. The appetite and rumination were suspended, and diarrhœa quickly ensued from nervous excitement. Saliva flowed profusely from the mouth, and the animal regarded the movements of a stick or piece of paper, held towards or away from it, with the most intense watchfulness, and after a time would rush violently at it.

On the 25th a second calf became affected, and, about the same time, one of the sheep (a ewe); in a few more days the third calf and the second sheep (a ram).

The first calf exhibited the most perfect quietude when any person stood near, but when left alone continued to bellow furiously, and, as far as the chain would allow, mount the manger or stall partition, or sometimes jump with all feet at once from the ground to a considerable height in a perpendicular direction, but from a loss of co-ordination in movement would fall helplessly to the ground—lying a few seconds upon one side, and rising with difficulty after several ineffectual attempts. The second and third animals were considerably more vicious: they would kick and run at all persons who

approached them. Their loud bellowing became constant and annoying, and, in the end, differed little from the braying of an ass.

The sheep were passive under the affection, being generally found with the head elevated and held to one side (Fig. 167),

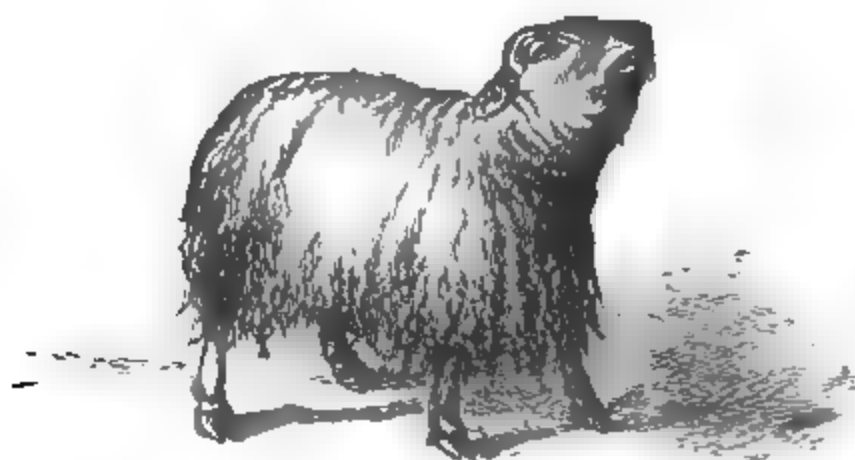


FIG. 167.—*Rabies in the Sheep.*

one ear and the eye-lid of the same side drooping—the latter nearly closed. Any sudden movement or unusually sharp noise would cause the animal to drop awkwardly, as the calves were described to do, and rising in a similar manner. There were no signs of vice, diarrhoea, or salivation in these animals. The ewe gave birth to two fine lambs about one week before the attack; but the milk rapidly diminishing, they sucked very little, and were subsequently fed from the bottle. They were fatted, and after some months went to the butcher, without having shown any signs of having inherited the malady.

It is to be particularly remarked that the wounds inflicted by the rabid dog had in every case healed up; but contemporaneous with the appearance of the special signs of rabies, *e.g.*, loss of appetite, difficulty in swallowing, &c., there arose such an intolerable itching or irritation in the parts, that the animals commenced to rub them violently against the nearest object, until they were again raw and bleeding.

In consequence of the great annoyance which arose from

the constant and unnatural bellowing of the calves, they were destroyed on the 27th, having lost flesh very rapidly. The ewe died during the night, and the ram the following day. The calf first affected was sinking fast, but probably would have lived thirty-six hours longer. The carcasses were taken for *post mortem* examination; the appearances which were presented are as follow :

Calf No. 1.—Posterior part of tongue, fauces, and pharynx swollen, and of a purple colour. Vocal cords congested, swollen, and ulcerated; lower part of trachea and bronchial tubes filled with tenacious frothy mucous. Numerous spots of ecchymosis on the surface of fat upon the heart; right auricle and ventricle filled with dark coagulated blood; left auricle also contained the same kind of blood, but the left ventricle was nearly empty. No ecchymosis upon the organ itself. Endocardium and substance of the heart rather pale. Costal pleura slightly congested; peritoneum healthy, but no fat in the folds; stomach and intestines generally pale; *vena porta* empty; abomasum about half full—contents semi-solid. Mucous membrane healthy. Omasum contained a small quantity of rather soft food between the leaves, which were pale—epithelium peeling off; reticulum, or second compartment, healthy, and contained a quantity of dry matter mixed with sand, the latter also blocking up the cells of the organ; gall-bladder nearly empty; bile pale in colour.

The carcasses of calves Nos. 2 and 3, exhibited in all respects similar conditions, and therefore will not call for special description. As the pole-axe had been used, the condition of the brain could not be examined.

Examination of the Ewe shortly after death.—A large collection of gas was found beneath the skin over the surface of the body. Mouth and fauces healthy; pharynx and larynx slightly congested; trachea and bronchial tubes healthy; heart soft and friable, and contained small clots of coagulated

blood; peritoneum healthy; spleen disorganized, and not unlike a mass of jelly; abomasum healthy and quite empty; omasum contained a small quantity of soft light-coloured matter; reticulum healthy and empty; rumen moderately filled with rather dry matter—ordinary food; intestines pale—small ones filled with gas.

The Brain.—*Dura mater* perfectly healthy; surface of cerebellum congested, internally pale and soft; in the depth of the convolutions of the cerebrum were also streaks of congestion; *corpus striati* and *choroid plexuses* congested, and the fluid of each lateral ventricle more abundant than usual. At the base of the brain the congestion is particularly well marked.

In the ram the brain was much more congested, and the membranes contained a considerable quantity of effused fluid. The fourth stomach also contained hæmorrhagic spots (ecchymosis). In other respects no differences were observed.

The symptoms here described exhibit the two forms of the disease, those seen in the calves being denominated the *active* or *acute* form; while those exhibited by the sheep were the *dumb* or *sub-acute* form. In dogs the acute variety is known as *barking* rabies, from the dismal howling made by the creature.

From the fatal nature of the malady all rabid animals should be segregated and destroyed as soon as possible, and no attempt to treat them should be made, as while they live no one can tell how far or to whom the contagious virus may be conveyed. And we may here incidentally state for the information of many uninformed in such matters, that the supposed belief in the ultimate and inevitable madness of persons bitten by dogs in health, but which afterwards “go mad,” is without any foundation whatever.—*Ed.*]

TETANUS—TRISMUS—LOCKED-JAW.

[A general and continued spasm or contraction of the muscles of the body, both voluntary and involuntary, is known

as *Tetanus*. When such a disease affects mainly or entirely the muscles of the jaw, it is then called *trismus* or *locked-jaw*. Two forms are most commonly observed: one, the *traumatic*, supervening upon local injuries; and the other, *idiopathic*, or of obscure origin, but doubtless from common causes, as hereditary predisposition, and influence of cold, irritation of the alimentary canal, &c. The ox and sheep seldom are affected, being less liable than the horse; nevertheless, when seized, suffer as acutely, and we think even more fatally. Both forms are common, being respectively caused by castration; the idiopathic form arising from bad food, exposure to cold and wet, &c. Working oxen are most liable to tetanus by virtue of the greater risk they run of injury, as pricks in shoeing, the effects of sudden alternations of temperature, &c., &c.

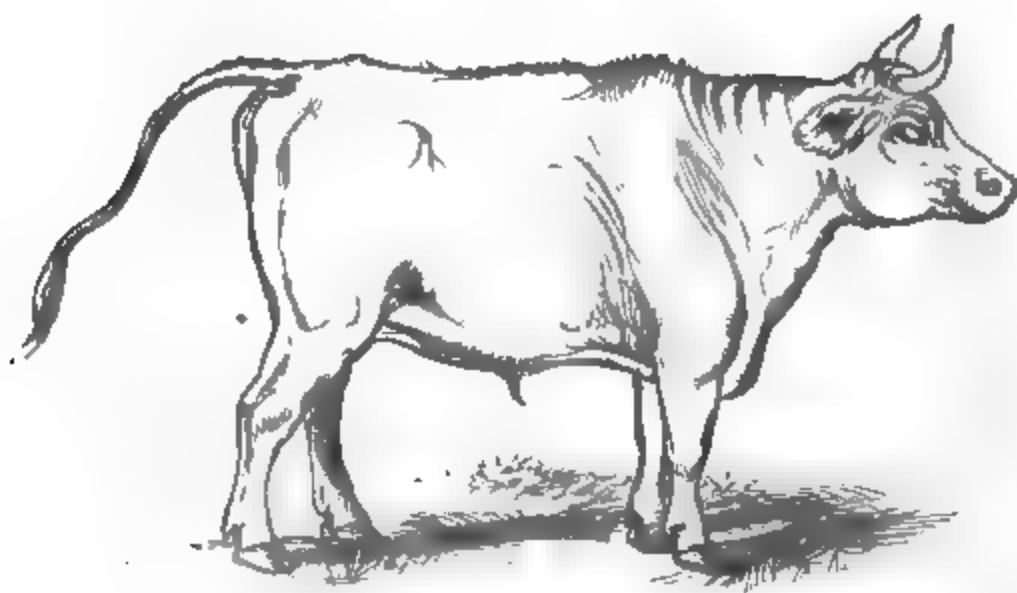


FIG. 168.—*Locked-Jaw.*

Symptoms.—Tetanus is insidious in its general characters. Beyond slight dulness and disinclination to feed, ruminate, or move, the attendants observe nothing, and even these signs may not occasion notice or comment with many. Shortly something unusual appears with regard to the animal, and the attendant makes an examination. The animal is totally different from his usual state, and has not moved since the

previous night. The hind legs are wide apart ; the whole body, neck, and limbs stiff, nose protruding, head and tail elevated, breathing accelerated, nostrils expanded, pulse frequent and corded. If the finger is inserted between the jaws, a large quantity of saliva flows when the lips are separated, but the mouth cannot be opened. When the head is raised, the *membrana nictitans* or *haw* rapidly passes backwards over the eye-ball, which is retracted within the orbit. The bowels are obstinately constipated ; the muscles of the body twitch convulsively ; swallowing is performed with difficulty ; the

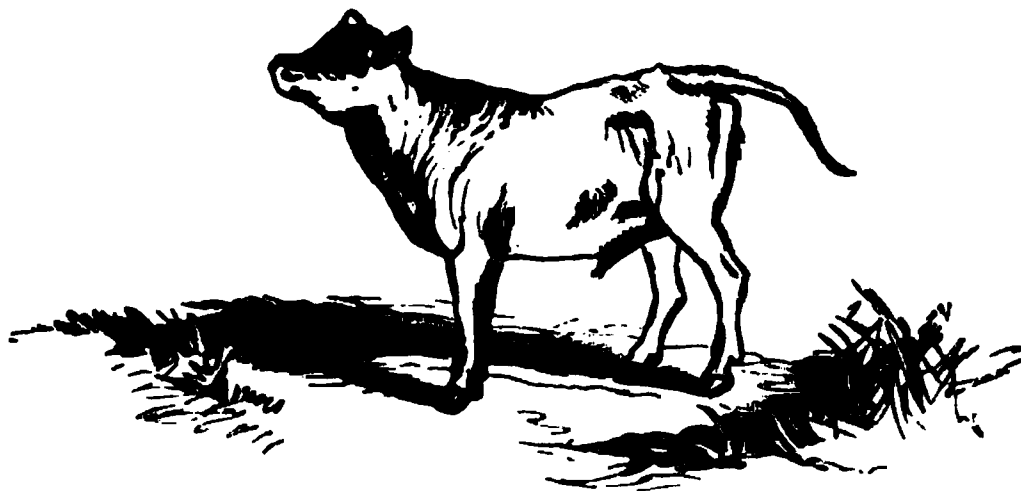
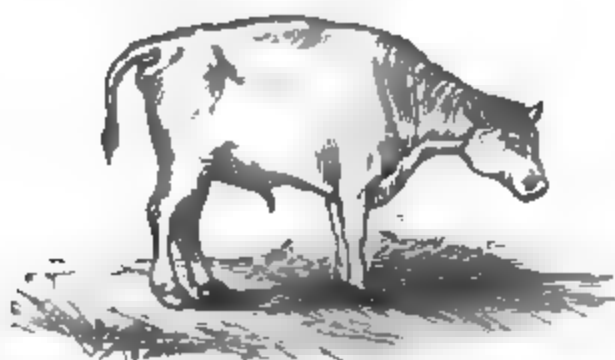
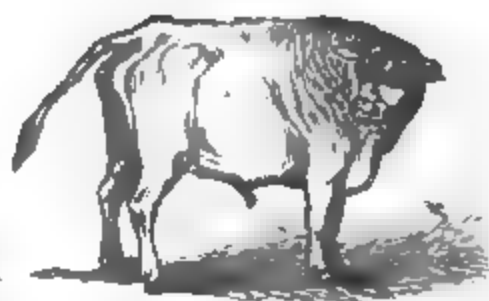


FIG. 169.—*Opisthotonos*.

abdomen and anus are rigid and contracted, and the limbs unbending and apart. The peculiar curving of the neck caused by the elevation of the head has obtained for this affection the name of "Stag-evil." The contortions of the body induced by this affection are frequently severe and extremely horrifying to a sensitive mind. In the mildest form the position is represented in Fig. 168, but in more acute spasm the back is arched downwards, as in Fig. 169, when it is termed *opisthotonos*. If the spine is arched in a contrary direction, viz., downwards, as in Fig. 170, it is then termed *emprosthotonos* ; and when lateral contraction occurs, as in Fig. 171, it is then known as *pleurosthotonos*.

Throughout the attack the disease manifests signs of variable intensity, and tendency to aggravation from sudden noises,

presence of people and their movements, and admission of light. Darkness produces a depression of the nervous excitement, and the animal frequently assumes a state of comparative quiescence. If the attack is intense at first, the sufferer frequently sinks with rapidity. If in milder cases he lives over the sixth or seventh day, recovery may follow. Cows and calves usually lie during the disease from the first, and never rise. Thirst

FIG. 170.—*Emprosthotonos.*FIG. 171.—*Pleurosthotonos.*

is frequently great, and the appetite not always lost, as the sufferer will generally take thin fluids through the apertures between the teeth, &c. Like epilepsy, tetanus furnishes no real knowledge of its exact pathology. It has been regarded as an increased polarity, or modified increase of nerve force; but such views are at the best incomplete and conjectural, and furnish nothing tangible upon which any plan of treatment can be properly based. The results of *post mortem* examinations also are barren of useful aid, and treatment of the most opposite and even irrational kinds have been as successful as milder measures. The great aim is to reduce the exciting causes. Remove all irritating objects, create suppuration in badly-progressing wounds by poultices, hot fomentations, &c., and provide the strictest seclusion and moderate light. When medicines are used, let them consist of calmatives generally, and be administered with as little disturbance as possible. Their admission to the system by the endermic method appears to promise usefulness, and requires further use and

confirmation. The bowels require attention, and are usefully acted upon at the outset.—*Ed.*]

NERVOUS DEBILITY IN COWS AT THE TIME OF
PARTURITION.

[This affection is variously known as *loin-fallen*, *the drop*, and technically *adynamia nervosa generalis*. It is frequently confounded with, mistaken, and treated for *metro-peritonitis* and *parturient apoplexy* (which see), hence the many voluble statements made by persons ignorant of the distinctive characters



FIG. 172.

of the three diseases, which go far to establish a false reputation for curing animals at such a time. The editor has reason to believe that many cases of so-called parturient fever and puerperal fever, &c., are nothing more than the malady he is about to describe.

This affection is undoubtedly due to functional disorder alone, and possesses as a rule no fatal tendencies. It does

not essentially follow protracted parturition, nor is it confined to animals in high or good condition, but is witnessed quite as frequently in those that are lean and poor, yet good milkers.

We readily distinguish the affection by the total absence of high fever or coma, or any tendency towards them. Although the pulse may be somewhat accelerated, it is compressible and frequently weak. The udder is soft, milk readily drawn from it, and the quantity plentiful. Constipation is more or less present, stomach full, but the appetite and spirits continue unimpaired. The animal remains in a natural position of rest (Fig. 172), the ears are active, head held and carried properly, and the utmost anxiety is manifested if the calf is taken from her sight. There is a tendency to coldness of the surface, and sometimes also of the extremities, which denotes a want of proper tone in the capillary circulation. Large cows, those having unusual visceral capacity, and others breeding from large bulls, are commonly affected. In such animals the great demand for blood for the support of the foetus, and change of structure which the womb undergoes in pregnancy, proves a powerful exciting cause.

It has been thought this affection might be accounted for on the grounds of some obstruction to the flow of blood through the abdominal aorta, by pressure from the increasing contents of the abdomen. This may partially be the case, but we are inclined to think if it were wholly the cause, the foetus must likewise suffer from the want of nutrition. On the contrary, we find the calf perfectly nourished, and the womb healthy, leaving no doubt that the entire cause is a debility of the nervous system, producing atony or deficiency of contractile power (irritability) of the muscular system, hence the animal cannot stand. Proportionate, therefore, with the demand upon the system, will be the delay of the attack, appearance of the animal, and continuance of the malady.

Treatment.—Evacuate the rectum by warm enemata, and act

promptly upon the stomach by purgatives, such as given at page 437. Keep the animal warm in cold weather by means of sacks, rugs, straw, &c., and apply a stimulating embrocation (page 440) to the spine from the withers to the hips, covering a space upon each side of about eight or twelve inches; or the parts may be previously warmed by passing a number of heated smoothing-irons over the back when covered by a cloth. Stimulants, as ammonia, alcohol, nitric and sulphuric ether, may be variously used in their prescribed doses, and strychnine according to circumstances.

Domestic Treatment.—Place the animal upon a good bed of straw, and after operations detailed above are completed, let the body be covered immediately. Allow tepid water or hay-tea to drink, sloppy but nutritious food, and remove the milk from the udder frequently by the calf or hand.

N.B.—Animal temperature suffers no augmentation in nervous debility. In Cassella's self-registering thermometer we recognize probably the most valuable test which in the early stages, and in the absence of pathognomonic signs, will decide that no identity exists between this affection, metro-peritonitis, and parturient apoplexy. When an increase of temperature arises in cows that drop within a short time before or after calving, the inference is that metro-peritonitis, parturient apoplexy, or complications, such as pleuro-pneumonia, &c., are present. When the coma of apoplexy comes on, a decrease takes place.

A very absurd idea prevails in many districts respecting the cause of cows dropping at the time of parturition. It is supposed that a worm is present in every part of the body, and to that is attributed any disease of the locality. Thus, when a cow drops at calving, or male animals suffer from any affection by which they are unable to rise, "a worm in the tail" is the cause; and if by any chance it cannot be found, the reason assigned is the profound nature of the disease.

Usually a sore place is detected, the result of being trodden upon, a condition almost common to all cattle. By close search a small tendon is seized and cut out—which is the supposed worm; but tradition, the authority on which the treatment is based, does not explain how it happens that cows sometimes do not recover after a complete removal of the offending parasite (?).

An amusing incident occurred some time ago in the experience of the writer, which goes far to show how many opportunities there are for the practice of chicanery and fraud upon farmers who do not care to seek for proper information, but rely upon those wonderful books of bygone times in which some of the most incongruous recipes and romantic notions of the maladies of animals are recorded. A farmer, who sends no little amount of milk daily to the metropolis, called upon a veterinary surgeon, and requested medicine for a young "bull that could not rise, and had been down several days." Upon inquiry, it turned out that physic *ad infinitum* had been poured down the creature's throat, and the veterinarian declined to send more, as in the event of death taking place his advice and medicine would be deemed the cause; and, urging that it was not required, advised the administration of stimulants, as brandy, &c., and requested the owner to report in the morning, when something then might be done. Nothing more was heard of the man or his bull until three weeks afterwards, when the former met the practitioner in company with several gentlemen, and at once proceeded to show how ignorant the profession is upon the nature of disease generally, in course of which something like the following dialogue ensued:

"Well," said the farmer, "you see you didn't know what was the matter wi' my bull. I cured him meself after all!"

"Indeed!" was the reply. "What was the cause, and how did you cure him?"

"Well," returned our friend, "it appears yo' warn't aware of

a wurrum in its tail, becos you said nought about when I saw you. I went straight home, but I knawed your advice about brandy wur all gammon, and so I picked up the tail and found a sore place; and when I cut it to pull out the wurrum, he jumped up like a shot."

"And my old friend," said a bystander, "if I were to cut a sore place in your arm or leg, do you not think you would jump up also?"

"No! no!" confidently returned the man of sense, "not unless there were a wurrum in it. No! no! I can't hae that! don't tell me!" And away he went, confident in having a better knowledge of disease than everybody else.

SECTION VIII.
DISEASES OF THE ORGANS
OF CIRCULATION.

DISEASES OF THE ORGANS OF CIRCULATION.

[Affections of the circulatory apparatus in different animals occur under variable conditions, and assume their characteristic signs with more or less intensity proportioned to the amount of exertion demanded from each. As a rule, in the domesticated animals a degree of obscurity and unintelligibility is connected with the diseases of this class, and particularly among sheep, pigs, and oxen. Their life being commonly one of comparative idleness, aggravations are not so generally prevailing as in the horse; activity and urgency of symptoms are frequently delayed in the former for weeks, which would prove fatal in the horse in a few days or hours. Thus their diseases are liable to be overlooked until an irrecoverable stage has set in. The obstructions to desirable progress in this branch of scientific knowledge are numerous, one of which, and not the least by any means, is that just mentioned—the absence of decisive signs at the outset.

Correct diagnosis of heart diseases depends greatly upon a comprehensive knowledge of anatomy and physiology, without which the merest approach towards decision is impossible. This explains why our earlier works upon veterinary medicine, vulgarly known as “farriery,” are mostly silent upon the question, or loaded with ambiguous and even positive mystification regarding it. But even the advanced pathologist experiences

468 *Diseases of the Organs of Circulation.*

difficulties which the human surgeon, with his higher patient, knows nothing of. The absence of speech in the lower animals forms but an atom of the hindrance before the veterinary practitioner. Differences in the anatomical peculiarities, alterations or modifications of form, and positions of organs as required by habit and life, &c., induce the origin of obstacles which cannot be overcome. In man, the heart can be examined easily: it is almost wholly exposed to the front parts of the chest. In the lower animals, particularly the bovine class, the heart hangs from the spine, and upon each side are thick organs—the lungs, dense masses of muscle, and heavy bones—all of which greatly interfere with a correct estimation by sounds. The ear may be applied, and other artificial means of eliciting information practised, but the difficulties obstinately remain, and the practitioner is frequently compelled to rely upon a peculiarly cultivated acuteness in an estimate of negative signs. Great advancement has, however, been made recently in a knowledge of these affections; and, doubtless, with a more appreciative return on the part of the members of our agricultural community, still greater results may be obtained. Among cattle and sheep, &c., the class of diseases of the organs of circulation is not large, but is highly important. Our detail will be mainly confined to the most common forms.—*Ed.*]

ANÆMIC PALPITATION.

[We have already referred to abnormal heart-sounds heard in the bloodless state or “Anæmia,” at page 50: we have now to notice it in connection with the heart as contrasted with other states, which will be referred to hereafter. Anæmia, in itself, is not an affection of the heart, but may be confounded with sounds the result of severe and fatal disease. The cause—as given in the article referred to—rests with the attenuated

and watery condition of the blood, which admits of the production of sound when different portions or columns are forcibly brought into contact within the blood-vessels by muscular effort like that of the heart. A heavy or dense fluid, as healthy blood, is incapable of giving rise to such sounds, by reason of its consistence and property of being somewhat elastic : sound by concussion is, therefore, destroyed ; but fluids of less density, as water, do not possess the property of being elastic, and thus portions meeting each other—particularly in channels like those of the heart and blood-vessels leading from it—at once give rise to the development of sounds as a result of their unyielding nature. Such are also louder and more regular than the sounds arising from heart disease, and, moreover, are generally removable by a tonic treatment ; although, in some instances, they return, as depending upon incurable remote conditions. In the course of the jugular vein a continuous kind of hum is heard (also as a result of anæmia), distinguished between the heart-beats, and, as it were, connecting the sound of one pulsation with the succeeding one. It is due to friction which the blood establishes against the inner coats of the vessels, but more probably against the veins, or those parts where the vessels split up or branch off, by which the current is separated into many others. These states require close attention, and are best learned by observation upon the living animal.—*Ed.*]

RUPTURE OF THE HEART.

[Ruptures of the heart are not common, and (excepting accidents as the cause) may be said to be almost unknown. The writer has known working oxen drop down when ploughing and instantly expire, and the cause stated by butchers to be bursting of the heart. Only one instance has occurred in which the writer has been enabled to trace the cause of death

470 *Diseases of the Organs of Circulation.*

to rupture. Old standing disease of the lungs had limited the circulation in that direction, and, in consequence of sudden exertion, when the ox was drawing a heavy load of turnips up-hill, rupture of the right auricle and pericardium took place, and the animal died almost instantaneously.—*Ed.*]

CYANOSIS—BLUE DISEASE.

[In consequence of the imperfect or non-closure at birth of the opening in the middle wall of the heart known as the *foramen ovale*, the blood of each side mixes and circulates indiscriminately through the system. The heart, most persons know, is composed of four compartments : two upon each side communicating with each other, but those of one side being entirely independent of the other. The cavities of one (the left side) are engaged in receiving and propelling venous blood, and the opposite contain arterial blood : the former is impure, the latter pure. Before birth the upper cavities upon each side communicate, in order to admit of a perfect flow of blood which is supplied direct from the mother, and needs no separation as in after-life, when purification depends upon processes within the system. The opening alluded to is sometimes pervious after birth, and we have the peculiar results—anæmia, venous pulse, anæmic palpitation ; and the skin and mucous membranes become deep blue ; the body puny and emaciated, and cold as clay. Moderate exertion causes the animal to drop exhausted, and not unfrequently hastens death.

This condition is only observed in very young animals ; though it may occur that, the opening being small, the progress of the disease is delayed, and the sufferer be destroyed as one making no advance in growth, and rather an annoyance than otherwise.

Another form of congenital malformation consists in the displacement of the heart—that organ being found *outside* the

chest, sometimes in front at the bottom of the neck, and at others beneath the abdomen. Such is most common to calves, but it has also been observed in lambs. Death has resulted in most instances shortly after birth. The condition is known in medical language as *ectopia cordis*.—*Ed.*]

CARDITIS.

[It does not appear that this affection exists except as a complication with either pericarditis or endocarditis, when abscess is almost certain to result. At no time is the muscular substance inflamed except in the immediate vicinity of any deposit or injury, &c. If the heart were to be affected throughout, stoppage of its action must inevitably take place. An instance of this occurred recently; but when the attention of the writer was directed to the animal, the signs of pericarditis were present, accompanied with a peculiar rushing sound, which was believed at the time to depend upon valvular insufficiency, or presence of a tumour or foreign body, &c., within the auriculo-ventricular opening. The pulse was indistinct, running at the rate of 140 per minute, animal temperature 104°, extremities cold, difficulty in breathing, &c.; death in a few hours. The heart, after death, was examined, and, in addition to the evidences of pericarditis, an abscess, formed in the walls of the left ventricle, had discharged its contents into the pericardium, and at each contraction of the heart received the fluids, and accounted for the peculiar rushing and plashing heard before death.—*Ed.*]

PERICARDITIS.

[Inflammation of the pericardium or heart-bag, and its continuation over the outer surface of the heart, occurs in two forms: first as a primary or idiopathic disease, and second as a complication with rheumatism and contagious pleuro-pneu-

472 *Diseases of the Organs of Circulation.*

monia in cattle. The cause of the first are cold, extreme alternations of temperature, and such causes as induce acute diseases of the respiratory organs generally.

Symptoms.—The animal may be observed to endure a shivering-fit, after which he becomes dull; the pulse is accelerated, full, and hard, but quickly becomes wiry, respiration is

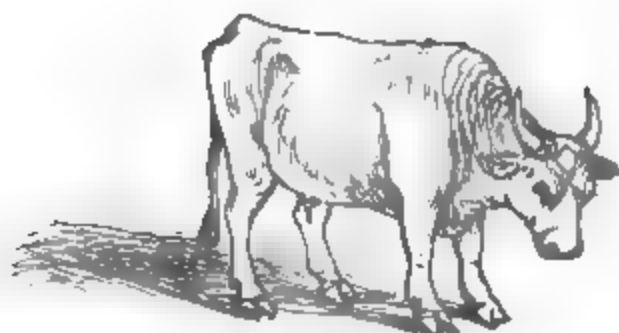


FIG. 173.—*Pericarditis.*

quickenened and laboured, nostrils dilated, bowels constipated, urine highly coloured; the head is held low, countenance is anxious, and indications of suffering are present; coldness of the limbs is remarkable, and they usually become œdematous or dropsical towards the latter stages; sometimes also the presence of fluid may be detected inside as well as beneath the chest, extending along the abdomen; pressure and percussion upon the left side give rise to great pain, and the amount of distress in breathing is considerably increased thereby; the flanks are hollow, a line runs along the side of the abdomen and chest corresponding to the external oblique muscle, which appears to be unusually contracted, and the whole abdomen is caused to act irregularly. Friction sounds are heard, which may be readily understood to differ from those of pleurisy by their occurring at the same time as the first sound of the heart, while the latter are in accordance with inspiration. A venous pulse is also present.

As the disease advances the friction sounds are obscured or silent, the pulse becomes exceedingly rapid, small, irregular, and indistinct, difficulty of breathing becomes greater, and

suffocation is frequently threatened. These signs are without difficulty associated with effusion in the heart-bag, which frequently kills the animal in four or five days from the first appearance of symptoms. Animals living beyond the sixth day usually recover.

Post mortem Appearances.—The presence of fluid within the chest is usually the first sign, for, owing to the mode in which the chest is opened, it flows out rapidly, and when pleurisy has existed the quantity is frequently large. In pure cases of pericarditis the heart-bag is distended, opaque, and thickened. When cut open, a more or less opaque fluid rushes out, and the lining membrane, as well as that investing the heart itself, is rough and covered with a reddish yellow exudation, in some instances uniting greater part of the bag to the heart. The inner part of the substance of the heart and lining membrane of the cavities are rarely affected.

Treatment.—Pericarditis, unassociated with rheumatism or contagious pleuro-pneumonia, requires active measures at the first outset. Some practitioners resort to the lancet, but experience appears to justify more the use of one of the cathartic drenches enumerated at pp. 224 and 240. In the next place, the action of the heart must be reduced, to effect which use nitre or the aconite drench (page 235). Digitalis and nitre are frequently given by some practitioners with good effect.

RECIPE NO. 156.

Take of nitre (saltpetre).....	4 drs.
Powdered digitalis	2 „

Mix, and give one-fourth part in a pint of gruel every three hours.

Mustard embrocations are used also in some instances, but the mixtures Nos. 7, 8, 9, 10, and 63 will be found of greater service to the skin of the ox ; but, it must be remembered, their application in the early stages will be attended with considerable increase of the disease. As soon as the pulse gives

474 *Diseases of the Organs of Circulation.*

indications of being reduced, the digitalis should be withdrawn, and then the embrocation would possess greater effects. Small doses of nitre are then to be allowed in the drinking water, the legs and body stimulated by friction in order to produce warmth, and the comfort of the animal generally secured. The use of tonics, particularly those of the mineral class, must be cautiously introduced.—*Ed.*]

FOREIGN BODIES LOCATED IN THE HEART.

[The peculiar disposition which cattle exhibit, and from which even sheep are not exempt, of swallowing various substances has been referred to under "Diseases of the Reticulum." We now have to state such sharp instruments as pins, needles, nails, &c., frequently find their way through the tissues to the heart, as a result of the contractions and other movements of the organs. In pigs also similar injuries are inflicted by these substances being supplied with the food. The results are generally fatal, as when the pericardium or heart is reached, inflammation (pericarditis) is the consequence, and that of an active character, death taking place in from one to three or four days after the attack.—*Ed.*]

ENDOCARDITIS.

[Inflammation of the lining membrane of the cavities of the heart is not known as a primary or idiopathic affection. As a complication with rheumatic disease it is more common—a peculiar tendency or diathesis being present, as well as sensibility to the causes of disease generally.

Symptoms.—Acute irritative or symptomatic fever, with the development of local signs of interference with the heart's action, as evidenced in the irregular contractions, combined with vigour and vibratory sensation. This ensures an unequal

beat or strength of the pulse ; its regularity also is degenerated into an intermittent form, in which three or four beats follow each other at variable intervals, and these are followed by a pause also of variable duration. It is, therefore, said to be irregular (as to force and time), and intermittent (as to the duration of time between the pulsations). One of the most distinguishing features in endocarditis, beyond its association with rheumatism, is the peculiar smallness of the pulse as contrasted with pericarditis—an effect of the inability to contract upon a large quantity of blood. A peculiar sound is heard also during contraction, known as the *bruit de souffle* or sound of bellows blowing, occasioned by the passage of blood over roughened and inflamed surfaces. Such states also interfere with the action of the auriculo-ventricular valves, by which the descent of the blood from the auricle to the ventricle is greatly interfered with. This is particularly manifest upon the right side, which gives rise to the venous pulse described at page 15 ; and in proportion as this interference is allowed to proceed, we also observe an amount of *dyspnœa* or difficult breathing, and, in very acute cases, even suffocation and death.

Post mortem Appearances.—Considerable thickening is found upon the inner membrane of the heart, and even enlargements or roughened deposits beneath it, assuming variable dimensions. These are sometimes connected with the valves obstructing their office ; at others, surrounded by false membranes, and in the vicinity, within the muscular walls of the heart, associated with them, may exist an abscess. Other cases, again, exhibit a shrinking of the valves and evident contraction of the auriculo-ventricular openings which these valves are designed to guard in health, and determine the proper course of the blood.

Treatment.—In this department, when advocating measures for endocarditis, they will be found to consist of those agents required for rheumatism generally—salines, as saltpetre, sul-

476 *Diseases of the Organs of Circulation.*

phate of potash, iodide of potassium, and bromide of potassium are required, or the aconite drench as repeatedly advocated ; and externally, at proper stages, active blisters. Endocarditis in cattle is very frequently a troublesome affection. The symptoms should receive early and prompt attention, and afterwards the efforts should be directed towards making the animal fit for the butcher. If the disease is subdued at the outset, this may be accomplished ; but if, on the other hand, delay occurs, the beneficial object of proper treatment will be frustrated ; and although recovery may appear to take place, relapse shortly occurs, and the creature may be doomed to repeated attacks and a protracted term of immeasurable suffering. Not unfrequently large tumours are found, as a result of such delay, within the cavities at some distant period, which give rise to disturbed states of the heart, and eventually sudden death.—*Ed.*]

HYPERTROPHY OR ENLARGEMENT OF THE HEART.

[This affection is not common among cattle except in certain cases of disease, when an enlargement of one portion may be observed. In the horse, an animal subject to severe diseases of the brain and *medulla oblongata*, such a state is not at all infrequent. As a rule, in cattle no characteristic signs are developed, those present being really caused by the malady with which the hypertrophy is associated, and from which it derives its existence.—*Ed.*]

EMBOLISM.

[By this term is understood the arrest of circulation within an important vessel, as a result of plugging by an accumulation of fibrine. As a disease affecting cattle and sheep, pigs, &c., no decided instance has come beneath the writer's notice. His acquaintance with it extends to the horse. Cases have been

described in cattle by Continental veterinarians, and by Professor Gamgee in this country, but no particular records are forthcoming. The iliac arteries are the most common seat of the affection, induced by the effects of some extraordinary movement, in which change in the structure and vitality of the vessel occurs, and fibrine accumulates around the spot as to a foreign body. It has been shown by other writers that the actual presence of foreign bodies is the cause, as fragments of lymph, &c.

The *Symptoms* produced are liable to be influenced materially by the length of time the affection has existed, and the extent of vessel affected, as well as its locality—paralysis, wasting of muscles, or false movement liable to be confounded with fractures, rupture of ligament, &c., &c. These conditions are of great interest to the pathologist, and call for the closest observation, and we hope ere long to possess records which may throw more light upon the pathology of this disease.—*Ed*].

SECTION IX.
DISEASES OF THE SKIN AND
ITS APPENDAGES.

DISEASES OF THE SKIN AND ITS APPENDAGES.

[Affections of the skin among the lower animals do not appear to have received that close attention they deserve: hence we find the works of the majority of writers upon veterinary subjects either positively silent with regard to them, or the whole are grouped under the simple term "Mange." The common integuments of the animal body are liable to the effects of different influences, and the manifestations of disease are modified in proportion to the degree of those influences, as well as prevailing habit of body, known as idiosyncrasy.

As in other parts or organs of the body, the operation of general causes are witnessed, and likewise from the relationship and similitude that is found to exist between the skin, digestive organs, and all mucous membranes, the operation of internal causes induce signs of special characters. The skin also suffers from blood diseases of two kinds, which have been already spoken of, viz., general affections of the blood, as purpura hæmorrhagica; and animal poisons, giving rise to eruptive and contagious fevers, as *variola ovina*, sheep-pox, cow-pox, epizoötic aphtha, rinderpest, measles, &c., &c. Lastly, special external causes, as parasites, also operate prejudicially. This class also will form a distinct subject for consideration under "Parasitic Diseases."

We here propose to consider those diseases of the elementary tissues of the skin, the causes of which partake of general characters.—*Ed.*]

INFLAMMATION OF THE SKIN (*Dermatitis*).

[Under this head various forms of inflammation of the skin are recognized, each the result of the operation of general causes, and exhibiting a great resemblance in nature. Thus we have *Erythema* or *Exanthema*, *Furunculus* and *Scorbutic Inflammations*, all of which attack the skin of man, but are not always common to the lower animals in their several forms and modifications. Some are more common in horses than among cattle, sheep, or pigs. Without attempting here to go fully into the full category of skin affections, we shall limit our description to those that are generally witnessed among the above-named animals. These, except the working ox, appear to be greatly relieved of maladies which affect the skin of the horse, and therefore our enumeration will be necessarily abbreviated.

ERYTHEMATOUS OR EXANTHEMATOUS INFLAMMATION OF THE SKIN.

This condition is induced as a result of the effect of certain local causes, as cold and wet alternating with heat; cuts, chafes, bruises, stings of insects; irritating agents, as caustics, dirt, &c.; and morbid processes, the result of plethora, poverty, &c., as scarlatina, rubeola, erysipelas, &c., &c. Several forms are recognized, viz., *Simple* and *Phlegmonous Erythema*, *Eczema*, and *Impetigo*. Each variety assumes acute and chronic characters.

I. SIMPLE ERYTHEMA, or *Erythema Intertrigo*,

is the most common form of dermatitis, and consists of an increased redness of the superficial parts of the corium, due to irritation. It is acute, and usually appears as a bright and uniform redness in the skin, but at other times is irregular,

presenting various outlines of shape or extent and variety in colour. This can only be well observed in the skin of white animals and those having very thin coats of hair, &c., which, if carefully separated, will exhibit outlines of a deeper hue, and sometimes a tinge of yellow. When pressure is applied the colour disappears, but collects again after its removal. The outer margin is not well marked, the blush of inflammation gradually disappearing, and terminating in the hue of health. Swelling is not extensive, but it may be detected in the diseased spot by the touch. Exudation is sometimes apparent in a gelatinous fluid that glues the hairs together, or small vesicles may form, which are sometimes confluent or scattered. Extension or continuance of this process results in a deeper colour being established, and exudation of a purulent fluid, ulceration, or sloughing. Resolution is marked by peeling of the epithelium, in the form of scales of greater or less fineness, the skin beneath gradually assuming the original degree of evenness and healthy colour. After death the redness and inflammation are confined to the outer layer of the skin (corium), as seen in a transverse section, while the deeper portion is pale and infiltrated only when the process has been intensely acute. The cellular tissue is also unaffected, or slightly infiltrated.

This form of dermatitis is frequently seen in calves having a pervious urachus, as a result of the urine irritating the adjacent parts of the abdomen as it flows irregularly from the navel. (See page 368.) When fat cattle and pigs are driven distances in hot weather, the perspiration and dust combined irritates the inside of the thighs and fore-arms; in the over-crowding of cattle, sheep, and pigs in ships and railway trucks, motion also induces similar results. Sheep also suffer from cuts inflicted by the sheep-shears, which become greatly aggravated by flies during hot weather. Working oxen and pigs are seen to exhibit raised marks or wheals, the result of

blows ; and where these have been repeatedly inflicted on one spot, exudation and subsequent sloughing often occur. Sheep and pigs frequently die, as a result of gangrene, when the cuts, &c., have been extensive.

Chronic Erythema.—This is a form of disease frequently met with upon the udder of ewes, teats of cows, and lips of lambs and calves. In consequence of the continued application of wet and cold, and irritation in suckling, a portion of substance of tissue is removed by ulceration, and the result is the formation of cracks, having thickened and hardened edges, from which oozes a thin gelatinous-looking fluid. This disease received from the Author the following notice in the earlier editions of his work—*Ed.*]:

SORE TEATS.

Some cows are more subject to sore teats than others : they are liable to this complaint at all seasons of the year, particularly such cows as have newly calved. If the teats be afflicted in the summer, they often become ulcerated ; and the flies plague and tease them to such a degree as to render it difficult to milk them. It is a great nuisance at the time of milking, as blood and corruption are liable to pass between the fingers into the milk. *The following ointment ought always to be kept in readiness for purposes of this kind :*

RECIPE NO. 157.

Take of elder ointment	6 oz.
Becs'-wax	2 „

Melt them together, and add

Sugar of lead, in powder	1 „
Alum, in powder	2 „

Mix, and stir them together till nearly cold.

The cow's teats may be well rubbed with this ointment every night and morning after milking. If in the summer, and the

flies plague them, add one ounce of assafoetida, in powder, and dissolve it along with the ointment and wax. This will prevent the flies from teasing the animal.

[The process of milking such animals is rendered very difficult on account of the pain experienced—sometimes mere handling of the teat being sufficient to infuriate the sufferer. Under such circumstances, the milk should be drawn away by the teat syphon (Fig. 163), an instrument already spoken of at page 437, as being sufficient to evacuate the udder without disturbing it. When flies are troublesome, apply a quantity of cotton wool to the whole of the udder, which has been previously saturated with salad oil, or the ointment (No. 157), and support the same by means of a broad bandage running over the back, as shown in Fig. 175.—*Ed.*]

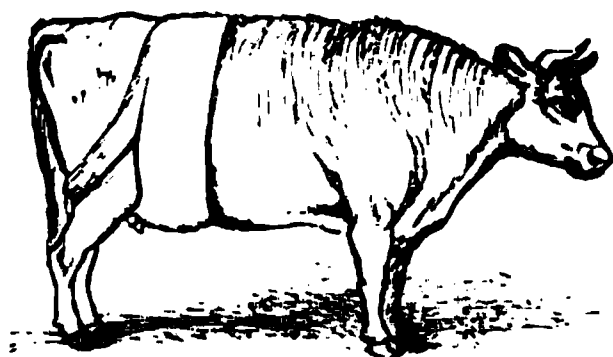


FIG. 175.

[Under circumstances of severe or protracted irritation, it may be desirable to shield the teat against the aggravating influences occasioned by the calf in suckling. For such a purpose proper tubes of India-rubber may be obtained ; but when these are not available, the calf should be otherwise fed for a time at least. It must also be noticed that young animals should not be allowed to suck during the time the ointment just given is used to the udder and teats, as poisoning may arise ; nor, for the same reason, should it be used to the mouth when affected. More reliable and safe remedies consist of collodion, glycerine and collodion, and solution of carbonate of soda with glycerine, and tincture of arnica.—*Ed.*]

2. ERYSIPELAS.

[This is the form of *phlegmonous erythema* or true dermatitis, and consists of diffuse inflammation of the whole thickness of the true skin (corium), sometimes involving also the sub-cellular tissue, and is attended with great pain and irritative fever.

It is caused by extension of inflammation from other parts, powerful external applications, burns, scalds, and sometimes without any obvious cause. The skin is intensely red, and the colour does not disappear under pressure; the parts are not inordinately swelled, but are hard and internally red, having lost their reticulated appearance; and beneath lies the cellular tissue injected and infiltrated, or exhibiting stages bordering upon the pustular. The terminations are resolution, suppuration, ulceration, mortification, or gangrene. Sheep are subject to erysipelas from the effects of cuts whilst being shorn, and it occurs in cattle as a result of injuries, and the subsequent effects of extreme heat and cold. Several cases have been seen in the practice of the Editor, which, affecting parts about the head, proved fatal. As an illustration of this affection, we quote the following particulars from private records.

A cow of the Ayrshire breed was seen to exhibit pain and



FIG. 176.

tenderness, with tumefaction of the right ear. The owner, thinking that if a discharge was promoted the case would at once recover, set about rubbing the ear violently between two sticks (Fig. 176). In some hours a fluid discharge took place, but the swelling increased rapidly, the ear became more than three times its normal size, and the neigh-

bouring parts—as the side of the face, eye, parotid gland, and

neck—were speedily involved in the tumefaction ; fever was severe, breathing difficult; and at last, about ten days from the institution of the primitive treatment, the animal died from complete suffocation and the effects of gangrene. The swollen parts had assumed an extreme size, and were black, and preparing for removal by sloughing. Scarifications were had recourse to at the first period of attendance, but only a slight quantity of thin fluid escaped, and the animal gradually sank.

Treatment.—Symptomatic fever should receive prompt attention : one of the many purging drinks already given should be used, and followed by doses of nitre or the neutral salts, aconite, &c., &c. ; afterwards various lotions are advocated, as those of lead, zinc, &c., and ointments of the same ; but probably the best application is simple lard, gently rubbed in, or continued hot fomentations. Some practitioners circumscribe the inflamed portion by applying a strong solution of nitrate of silver on its outer margin ; while others use glycerine, water, and laudanum, in which a small quantity of ammonia is dissolved. The effect of a slight stimulant appears to act beneficially in restoring circulation, limiting the extension of the disease, and preventing death of the integuments.—*Ed.*]

3. URTICARIA.

[This form of exanthema is generally known as “Nettle-rash,” occurs in a sudden form, and consists of a number of elevations of the skin, varying in size from a sixpence to three or four inches in extent, accompanied by intolerable itching and slight heat, but no manifest tenderness or symptomatic fever except in rare cases. Cattle that have been badly kept in winter and rapidly become plethoric, suffer during the hot months of the succeeding summer, the disease being attended with shedding of the hair in a few days, and disappearance of the eruption in from ten days to a fortnight. Sheep and pigs are also said to be liable to the affection from similar causes.

Treatment.—Active purgation and the use of neutral salts during active fever, and a lotion containing glycerine, carbonate of soda, and laudanum, as a wash for the parts, applied several times a day. The hot-air bath is valuable ; and during the prevalence of the malady, sulphur and potash, in powder, should be given in the food daily. Cleanliness, with every attention to domestic comfort, are indispensable. Under the name of “Stinge,” a variety of urticaria is sometimes witnessed in cattle during hot weather, when the mouth and nose are principally affected, and from which the most urgent signs are developed. —*Ed.*]

4. PRURIGO.

[Under the name of “Spring lice,” or *prurigo vernalis*, this affection is frequently seen among cattle, particularly during the early parts of the year. The affection consists of inflammation of the papillæ of the dermis or true skin, the subsequent formation of crusts or scales, and depilation or falling off of the hair. From the location of the disease, it is also called *papular*; and the appearance has prompted the term *lichen* or roughness, from its great resemblance to the lichenous plants. Great irritation takes place, numerous pimples form over the body and legs, the animals exhibit an unhealthy appearance—in fact, they are hidebound—the coat stares, and, if neglected, the liability to other more severe diseases is secured.

Treatment is similar to that advocated for “Urticaria.”—*Ed.*]

ECZEMATOUS OR VESICULAR FORMS OF ERYTHEMA.

5. SIMPLE ECZEMA.

[This is attended with intolerable itching, rarely with symptomatic fever, but always the formation of luxuriant crops of vesicles, which succeed each other at different parts,

and leave the skin and hairs moist with their contents. The hairs are rubbed off by the violent acts of the animal, and the skin beneath is exposed as a red raw surface. There is therefore a tendency for the disease to attack in patches many parts of the body, but not always at the same time. As rapidly as the vesicles form in one part and are burst and rubbed off by the animal, others form at various spots, and keep up the most intense and continuous excitement. It is, however, not very common in cattle, but is seen in those subjected to irregular modes of living and domestic management. Such observed in pigs have been condemned as small-pox, measles, &c., &c., by persons ignorant of diseased states.

Treatment.—Purgatives, daily doses of the acetate of potash, neutral salts, &c., and dressings to the part in which laudanum and glycerine enter ; lard with morphia or belladonna proves also exceedingly useful externally. Regular diet and proper food, cleanliness, &c., must be strictly observed.—*Ed.*]

6. CHRONIC ECZEMA (*Psoriasis*).

[Neglected forms of eczema are apt to degenerate into an obstinate condition, in which a permanent thickening of the skin occurs, associated with a low form of inflammation and ugly cracks or fissures across the indurated parts, which discharge a constant half-purulent, half-ichorous fluid. Upon the thickened portion of the skin is found a great increase of the epidermic cells, shooting up in perpendicular strata, and hairs which may be growing from the parts are frequently glued to them by the secretion. Vulgarly these are called “rat-tails” from the great resemblance they bear in horses.

The parts where this disease is located are the legs chiefly, one, two, or all of which may be affected. We have seen cattle of all ages turned upon clay pastures, and those in which lime abounds, suffering repeatedly from the combined irrita-

tion of these substances with wet and cold, as well as severe

lameness, to the great detriment of condition, health, and even sloughing of hoofs.

Treatment. — Fomentations for a lengthened period, followed, if possible, by hot poultices. The animal should be removed to clean quarters, and receive at first laxative medicine, afterwards the treatment prescribed in the last form. Liquor

arsenicalis must be given internally in very old cases.—*Ed.*]



FIG. 177.—*Psoriasis* or "Rat-tails."

BULLOUS ERUPTIONS OF THE SKIN.

[Several varieties of this form of exanthema are described by medical writers, and some confusion has arisen from the circumstance that terms used have been somewhat similar. The term *bullæ* is understood to mean bladders or vesicles, blebs or blisters; and from the tendency to spread which certain forms of disease manifested, the term *herpes* has been given to them. Two forms are witnessed among cattle and sheep, and occasionally among pigs.

7. PEMPHIGUS.

This term signifies a bubble, and denotes an erythematous state of the skin, accompanied by the evolutions of bladders (*bullæ* or vesicles) of every variety of size, from the smallest kind to the dimensions of a walnut or even a hen's egg. The affection is seen upon all parts of the body, patches of which

are involved in a partial or general vesicular eruption. The constitution suffers more or less in proportion to the size and number of the vesicles, as well as the nature of their contents. In the milder forms the fluid contained is serous, transparent, and colourless or yellowish; but in severe cases it becomes red or purple, from an admixture of blood and also pus.

The bladders appear rapidly; a space perfectly free and healthy at one time will be covered in a few hours with them, and in mild forms their existence is transient, disappearing as rapidly as they formed. The terminations are usually by rupture and drying of their walls (epidermis) into a thin scab or crust, having a brown colour; sometimes evaporation ensues without bursting, and the same kind of crust forms. When this is removed the skin below appears red, congested, and continues in that state some time after the acute stage has passed. Pemphigus sometimes assumes a chronic and indolent form, extending over months and proving very troublesome. In some seasons it may prove enzoötic; but in the benignant form, an instance of which is mentioned by M. Loiset* as having occurred during the year 1857 in the vicinity of Lille, 125 animals being affected.

Acute pemphigus appears as an evidence of disturbance of the mucous membranes internally, as of the alimentary canal, uterus, &c., &c. Chronic forms depend upon similar conditions induced by previous disease, and existing under debility, old age, &c.

Treatment.—Gentle purgatives, and afterwards alkalies, as daily doses of the carbonates of soda, potash, &c. Local remedies consist of opening the bladders early, and applying astringent powders, as starch, oxide of zinc or lotion of zinc, nitrate of silver, chloride of zinc, or the tinctures of catechu, kino, galls, myrrh, bezoin or benjamin, &c., &c.—*Ed.*]

* Vet. Rev., Vol. I., p. 90.

8. HERPES.

[Two forms of herpes are described, one of which only we notice here, viz., *herpes circinatus*; the second, *favus*, will be found classified under "Parasitic Diseases."

Herpes circinatus (a creeping circle), vesicular or false ring-worm, is common among horses, and of less occurrence in cattle, &c. It is a benignant form of vesicular erythema, in which the bullæ aggregate in a circle, and gradually enlarge for a time, running their course in a week or ten days, declining into brownish scales, the redness of the skin beneath fading gradually. Occasionally it assumes a chronic form, when the patches may be numerous, and produce some constitutional disturbance, but the amount of irritation is slight, and gentle friction appears to afford a soothing sensation.

Treatment.—Same as for the preceding.

In the accompanying engravings the disease is exhibited in two stages. Fig. 178 represents the bullæ or vesicles as they

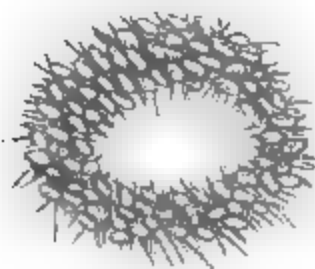


FIG. 178.

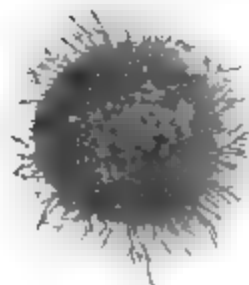


FIG. 179.

aggregate and arrange themselves in the circular form, with a tendency to enlarge and spread outwards, invading fresh portions of skin and hair. Fig. 179 shows the denuded surface, and as it appears after the vesicles have burst or evaporated, leaving the crust or scab.—*Ed*]

IMPETIGO, OR PUSTULAR FORMS OF ERYTHEMA.

[In this category, three varieties are described by Conti-

mental veterinary surgeons as occurring rarely among cattle, but more commonly in calves, lambs, pigs, and goats. These are

9. IMPETIGO LARVALIS,

so called on account of the appearance the animal affected presents, viz., as having on a mask. The disease consists of the luxurious formation of pustules about the mouth, lips, &c., of different animals, which form a thick incrustation, and in a few days drop off, exposing the corium beneath in a state of intense inflammation. Pigs present a curious appearance: the face, around the eyes, over the neck, and even as far as the back, being affected. In lambs the locality is the lips, one or both of which may be affected; calves suffer from the disease, being located principally about the upper lip, and extending to the mucous membranes of the mouth and nostrils. In proportion as the animal is allowed to suck, the disease has a tendency to continue.

10. IMPETIGO OF THE FACE AND LIPS.

This is known as *impetigo labialis et facialis* in technical language, and forms a great contrast to the preceding affection. The causes of *impetigo larvalis* appear to rest with the rich milk which the animal obtains from the mother, or later in the year, when lambs are feeding upon irritating green food or long grass, when dews and frosts are prevalent. The form we now consider appears only to attack animals at grass, or when feeding upon certain substances, but observers are not quite agreed upon that point. Young sheep, goats, and pigs are said to suffer most, and exhibit a pustular eruption, upon which yellowish crusts form, and adhere with firmness to the skin beneath, which is thickened immensely in many instances. The separation of the superficial crust or scab is frequently long delayed, and requires the use of powerful unguents for

the purpose, as those of the biniodide or nitrate of mercury; astringent lotions, as the chloride or sulphate of zinc, are sometimes used afterwards.—*Ed.*]

II. ECTHYMA.

[This is a common affection among pigs and sheep, and more rarely in cattle. It consists of inflammation of the skin of an acute nature, and in various parts of the body, accompanied by a number of large, prominent, and well-defined pustules, which are isolated, having no opportunity of becoming confluent. The surrounding parts are hard and highly inflamed; and the pustules, after maturation, leave dark-coloured crusts, which, on being detached, expose variably a brown stain, deeply-congested surface or superficial ulcer, resolving shortly into a cicatrix.

The disease is not well observed in the lower animals, particularly in cattle and sheep; but when seen in the latter, is very likely to be mistaken for small-pox. This took place in one instance which fell beneath the notice of the writer shortly after the suppression of the Cattle Plague. A young man, examining some sheep, found a number of pustules upon the skin of the inside of the thighs, and expressed an opinion that they resembled small-pox most closely, but admitted other specific signs of that affection were absent. Some uneasiness was at once created in the owner's mind, and forthwith an investigation was instituted, which, corroborating the opinion expressed regarding the great resemblance, further decided the affection to be the non-contagious ecthyma—one of the impetiginous forms of exanthema. The affection may be frequently seen if carefully sought for, upon those parts of cattle covered by thin skin and few hairs, as upon the udder and about the vulva, inside of the thighs, &c.

The differences in this and the affection—small-pox—will be apparent on a reference to the figures annexed :



FIG. 180. -*Ecthyma*.



FIG. 181.—*Small-Pox*.

a. The eruptive stage. b. The pustular stage.

FIG. 182.—*The Confluent Form of Small-Pox*.

The *Causes* and *Treatment* are those of erythema generally, the latter being of a simple character, as very rarely any constitutional symptoms are apparent, the general characters being commonly benignant or mild.

Treatment.—Same as for “*Urticaria*.”—*Ed.*]

FURUNCULAR INFLAMMATION OF THE SKIN.

[We refer here to this affection as common to the skin, and more particularly to describe its anatomical lesions. It is claimed in the category of anthrax diseases, and forms the malignant pustule of man and the lower animals. A milder form is known as “simple furuncle,” and the more extensive as “anthrax.” The characters are as follow: Furunculoid inflam-

mation—boils or carbuncles, as they are commonly denominated—consist of inflammation occupying the deepest layer of the corium, as well as the cellular tissue beneath, the interspaces of which are filled by it. Externally appears at first a small circumscribed swelling, probably not larger than a millet-seed or pea, around which a wide halo of inflammation exists, and determines the amount of pain and tension. Within the interspaces already named, accumulate the products of inflammation—plastic exudation : this exists throughout the thickness of the corium, and, as reactionary inflammation ensues, suppuration occurs, and it is thrown out. This is the core, so-called.

In simple furunculoid only one of these products is formed ; but in anthrax there are several in close approximation. When the diseased mass of anthrax is cut across, the fresh surfaces exhibit an uniformly red, spongy, and reticulated tissue, the interspaces of which are filled with the products of inflammation, each of which forms a core. At the period when suppuration is about being established, each core is surrounded by a jelly-like substance ; and when the process is fully complete, they are detached from the surrounding tissue, which is eventually destroyed. Cavities of variable size are then formed, containing the purulent fluids of suppuration, and in which the cores are able to float.

Lastly : the surface externally exhibits in anthrax furunculoid a number of openings, which communicate with the interstices or cavities already named, and the whole affects a deeper part of the skin than in the simple form ; the pain also is more intense and excruciating.

Apart from the malignant forms of anthrax, which have been noticed under “Enzoötic Diseases,” furunculoid inflammation of the skin is to be treated by poultices, fomentations, and general attention to dietary, as well as sanitary, rules. When the states are of a chronic and malignant character, the

knife must be used, caustics applied, and the animal supported by stimulants, mineral acids, &c., &c.—*Ed.*]

DISEASES OF THE CELLULAR TISSUE.

[Cows frequently suffer from an acute but œdematous or dropsical swelling, which takes place in the hind legs, about the udder, abdomen, &c. A previous attack of some other disease, as epizootic aphtha, or the effects of alternations of extreme temperatures will also give rise to it, and from which the animal frequently suffers greatly for some days. The swellings pit under pressure, and the skin exhibits signs of inflammation, which chiefly exists in the deeper structures of the corium. The constitution suffers from irritative fever, and the secretion of milk fails, bowels are constipated, urine deficient and highly coloured, appetite and rumination are also interfered with.

The terms *œdematous erysipelas* and *erysipelas boum* have been given to this affection.

Treatment.—Incessant fomentations for several hours; purgatives at an early stage, followed by the use of acetate of ammonia, aconite, the neutral salts, &c., daily; and when the skin exhibits acute inflammation with tenderness, lotions containing laudanum, morphia, belladonna, &c., should be applied.

The duration of the disease is three or four days, but frequently extends to a fortnight or three weeks.—*Ed.*]

HIDEBOUND.

[Animals suffering from febrile diseases, irritation, or functional disorders of the alimentary canal and organs of digestion generally, indicate a tightness of the skin not compatible with health, known vulgarly as *hidebound*. From the intimate connection that exists between the digestive organs and the common integuments of the body, the latter participates greatly

in the disorders of the other, and the result is functional derangement, manifest in a want of pliancy, harshness, dryness, or want of secretion, &c. Coarsely-bred animals have thicker skins than others, and present a hidebound appearance continually, without the ability to make flesh. Such is a sign of derangement, and may probably be caused by circumstances over which there is no control, and may render the animal of little service in the dairy.

Treatment of hidebound depends greatly upon the cause. As it always exists as a sign of other complaints, the original disease must first receive attention—an alteration of which suffices generally for the removal of the functional disorder in the skin.—*Ed.*]

ANGLE-BERRIES.

These are cutaneous tumours growing out above the surface of the skin, and of different sizes, with a very disagreeable appearance. Young heifers, or cows of their first and second calves, are the most subject to them. These fleshy excrescences make their appearance on different parts of the body.

Those upon the udder are not only disagreeable, but cause the cow to be very troublesome to milk. They rise from a small base, and hang in a pendulous form, of different sizes. The common method made use of to extirpate these excrescences is to fix a ligature round their bases, and to suffer them to rot off themselves. Others, after they have been well secured with a strong cord or twine, will cut them off with a sharp knife, and anoint the part with oil of vitriol. But the most ready and effectual way is to throw the animal down, and take hold of the angle-berry at the base with a pair of broad flat barnacles (such as are used in farriery), then take a firing-iron, after it has been sufficiently heated, and sear or burn it off; touch the seared part all over with a skewer dipped in oil of vitriol or aqua fortis. Either of these will

destroy the roots and prevent them from growing again ; but if they be attended to in time, before they come to their full growth, they may be eradicated by applying the following ointment :

RECIPE NO. 158.

Take of green vitriol, white vitriol, and blue vitriol, of each, in fine powder	1 oz.
Camphor, dissolved in $\frac{1}{2}$ oz. rectified spirit of wine ...	2 drs.
Sugar of lead	$\frac{1}{2}$ oz.
Hog's lard	$\frac{1}{2}$ lb.

Mix them well together on a slab, and keep in a pot for use.

A small quantity of this ointment must be rubbed on the angle-berries, warts, or any excrescences that may grow upon the udder or other part of the body, every night and morning. This ointment will gradually waste them away without injuring any other part.

THE FOOT-HALT AND FOOT-ROT.

These diseases in the feet of sheep appear to me always to proceed from one and the same cause ; yet, if any person wishes to make a distinction, it may easily be done by considering the *first* stage of the disease as the *foot-halt*, and the *last* as the *foot-rot*.

[Foot-rot in sheep appears to be one of those diseases respecting which few searching investigations and profitable advances have been made. Those who are inclined to be cynical or captious, and consider this statement derogatory to the veterinary profession, of which the writer is a member, must be asked to pause before they visit their anathemas upon it. We candidly admit that veterinary science has done little for the farmer ; the cause, however, has not been one of unwillingness, but inability and obstruction. When the majority of agriculturists afford greater opportunities to the scientific investigator, and rely less upon the absurdities and crudities of shepherds and cowmen, they will discover the

utility of science as an aid to the building of their profits. By adherence to the traditions of ignorant minds true progress is hindered.

We cannot attempt to enter into even a summary of the vast array of supposed facts that have been at various times brought in favour of the contagious nature of the malady which we are about to discuss. Suffice it to say that as a rule those outside the profession are ignorant of the conditions which stamp the nature of contagious diseases, and are too apt to view a wide-spread malady as propagated by their means, when the only evidence brought forward consists in the reiterated assertion—"Well, I think it is infectious," or "I can't get it out of my mind at all events;" and believing that a number of cases of the same kind existing contemporaneously with each other must be a test of contagion, the fact is given as the only proof. Observation is here eminently untutored and deficient. But we do not expect to find in all an erudite acquaintance with comparative anatomy, animal physiology, chemistry, hygrometrics, meteorology, &c.; and hence the submission with which we endure the anathemas, and still entertain the humble desire to offer the foregoing explanation, as well as appeal to their better nature.

It is not our intention to enter into a minute detail of the anatomical structures involved; an enumeration as we proceed must suffice.

Nature and Symptoms of Foot-rot.—It is probably in consequence of the various forms in which this disease appears that so many opinions are held concerning it. In some instances the hoof is entirely removed; while in others a few sinuses discharging a fœtid and ichorous fluid are all that can be seen, or surfaces are denuded of horn, and a sprouting, bleeding fungus is present in its place. These are evidences of irritation existing internally—inflammation causing the destruction of the tissues of the feet in the form of suppuration, and

eventually ulceration, and the offensive nature of the discharge secured by the elements of the hoof under influences causing its destruction, as well as admixture of other fluids and disordered secretions—a result of the same process. The animal is lame in accordance with the amount of disease and number of feet affected, and frequently may be seen crawling about upon the knees when the fore limbs are the seat of the malady. Condition is also greatly sacrificed, and the feeding and progress of a flock or a number of cattle are much retarded.

Causes. — Irregular growth of horn, producing unnatural bearing, strain, and rupture of internal parts, or exposure of them by splitting of the horn, and subsequent irritation by the insinuation of dirt, sand, &c., &c. Such may be said to be the causes in an irregular, hilly, or dry district.

In low localities the great cause is wet, producing a softening of the hoof, its subsequent wear and exposure of sensitive surfaces, and irritation by the access of dirt, wet, and cold. In extremely hilly districts we have found that rupture of the interdigital ligament (Fig. 183) and subsequent inflammation of the secreting glands and coronet, &c., frequently induce the malady. Pus forms in consequence, and burrows downwards through the softer tissues among the bones of the feet within the hoof, and thus the states already described are brought about.

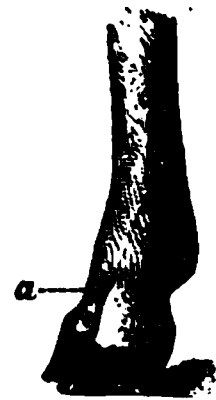


FIG. 183.
a. Position of the interdigital ligament.

Throughout we have been describing the phenomena that obtain in sheep under the term given in the older works on farriery; but the reader must submit to his belief being extended to an admission that it also applies equally to the disease in cattle known as "Foul in the Foot." Technically these diseases are best designated as *paronychia ovium*—foot-rot in sheep, and *paronychia boum*—foul in cattle. The word *paronychia* signifies an abscess near the nail or hoof; and by the terms *ovium* and *boum* we at once distinguish the species

of animals affected. Thus far, we, as a profession, are enabled to decide more correctly the stage at which our knowledge of the disease has reached. The maladies named are exactly alike in nature, due to the same causes, operating differently, but producing the same results. In detailing the remedial measures of "foot-rot," we also give those necessary for the analogue in cattle—"foul," "foot-halt," and "the low," so called.

Treatment. — The condition of the foot should be carefully ascertained, as the treatment must be adopted in accordance with the stage of the affection. The space between the claws must be examined, and all foreign bodies removed. The superior or upper edges of the hoof are here sometimes loose, and favouring the collection of foetid pus. These should be removed by a proper knife, which must be sharp, in order to excise them effectually without the pain that is inflicted by one having a dull or ragged edge. Such a knife is figured in



FIG. 184.—*Foot-Knife.*

the engraving (Fig. 184); having a hook at the extreme end, and cutting-edge also upon the back, it may be used in any position.* All portions of hoof should be removed which may favour the collection of pus, and it may be necessary also to take off other portions in order to reach an opening or sinus below.

These remarks also apply to diseased parts outside the hoof or upon the sole; and if it were possible to apply poultices or fomentations, they would be found a most valuable assistance to the proper progress of the disease in removing dirt, &c., which sometimes escape observation. This is, however, impossible in most instances, and other measures are advocated in lieu of them. Fungoid growths are usefully suppressed by the mineral acids. A piece of stick, having some tow twisted upon the end, eminently answers the purpose of their applica-

Messrs. Arnold and Son, West Smithfield, make these knives expressly for the purpose. Two are required: one, the larger, for cutting off large pieces; and the second, having a narrow blade for opening up sinuses, is called a "searcher."

tion. In a diluted state they may be applied to the surfaces uncovered by the removal of horn by the knife.

When the raw surfaces are extensive, the foot may be wrapped in tow saturated in chlorine water (page 91), or solution of carbolic acid, and kept from the wet and dirt. When the interdigital space is affected, dressings may be applied by means of a rag, as shown in Fig. 185. Other remedies are phenylene or terebane, butyr of antimony, ointment of the nitrate of mercury, &c.

Sinuses should be carefully explored, dirt and discharges removed, and a solution of corrosive sublimate, containing five or ten grains to the ounce, should be injected by means of the glass syringe, Fig. 18, page 66, every day, and the external surfaces dressed with the following lotion :



FIG. 185.

RECIPE NO. 159.

Take of chloride of zinc	2 drs.
Tincture of arnica	1 oz.
Water	1 pt.

The prevention of foot-rot is a subject which should engage more attention than it has up to the present time. The question of drainage is too apparent to require any notice here further than to urge its importance as one of the principal agents in producing the disease. The feet of sheep should receive regular and periodical attention. Shepherds should receive instruction in the mode of using the drawing-knife and rasp in a suitable manner, and not be allowed to abscise portions without sufficient reason for the operation. The toes require to be shortened, and the sole and crust towards the toe pared down, when the tendency is to grow too long. This will be more apparent by a reference to the annexed diagram (Fig. 186). Such accomplishments appear trivial, nevertheless require



FIG. 186.

Showing the line, from *a* to *a*, which should form the ground surface of the foot.

great judgment and knowledge of form, and a few lessons obtained from a veterinary surgeon who has given his attention to these matters would prove of immense service.

Wet ground should be avoided as much as possible, and where the animals are unavoidably kept upon it, great benefit will be found from the use of the following ointment once or twice a week :

·RECIPE NO. 160.

Take of Barbadoes tar	1 lb.
Burgundy pitch	1 „
Mutton suet	1 „

Melt the Burgundy pitch and suet over a slow fire, then add the tar and incorporate thoroughly. If, in summer-time, the ointment proves too thin, the quantity of Burgundy pitch may be increased by half a pound. By the addition of the various acids, &c., already named, this ointment will prove invaluable as a dressing in which to tie or bind up the feet when the soles are worn through and fungoid growths present.

We have frequently observed young cattle as well as dairy and other stock suffering from acute abscesses about the feet, which by neglect or improper treatment not only constitute the condition termed “foul,” but even destroy the bones entirely. The cause is to be attributed to the irregular overgrowth of horn, which, upon an irregular pavement, produces an unequal pressure and tension; and the result is, as in sheep, laceration and inflammation of important sensitive structures. The accumulation of dirt around or between the hoofs acts as a further irritant, and we have all the conditions that may be observed in a case of the so-called “foot-rot” in sheep, or *paronychia ovium*.

The treatment in all the stages must be conducted as already detailed for sheep, level and clean floors being indispensable.—*Ed.*]

SECTION X.
PARASITIC DISEASES.

PARASITIC DISEASES.

[Next to contagious affections among our domestic animals parasitic diseases may be ranked in their destructive effects. This fact, however, is not usually acknowledged or even recognized. But little is known, and much less has been promulgated among agriculturists, with reference to the nature and causes of many of the common diseases incidental to stock generally; therefore we must not feel surprised that fresh additions to our calamities are observed with a distorted vision or regarded as things to be endured, and that incidents of a startling or sensational character only succeed in rousing us to a spirit of calculation.

No one has to regret these conditions more than the farmers of Great Britain. But, as the sequence of events has run, affairs could not have been otherwise; and it is nevertheless as certain that if they had not reached the present crisis, sooner or later they must have done so by virtue of peculiar modes or influences in their effects upon each other. We hope to render this fact apparent throughout succeeding pages, and also, that while agriculturists are not altogether immaculate, they are notwithstanding as much "sinned against as sinning." We are too apt to decry against what are deemed social evils in foreign quarters, when a proper scrutiny would reveal that they are in reality the reaction of malpractices at home. There is a great deal in the affairs of agriculture that needs reformation; and doubtless the spirit of education and improvement, which

leads the arts and manufactures, and is daily becoming more and more prominent among the tillers of the soil, will not be without corresponding effect. Agriculture will not be what it ought until the value of British stock is more carefully recognized, and veterinary science taken as its handmaid. Much may be done in the way of administering remedies to suffering patients, but infinitely more by the exercise of knowledge and application of agents towards *preventing* the disease we have to fear.

In diseases like those we are about to consider, as well as a host of others, *curative* measures are in numerous instances only so many aids to the destruction of the animal; and no wonder that discontent, with loss of faith in remedies, or the adoption of some Utopian principle, should result. Like the sister science—human medicine, which was formerly held in the tenacious grasp of barber-surgeons, ascetics, witches, *et hoc genus homine*, but has now outlived the base enthralldom—veterinary medicine must outlive the yoke of quackery, with which it is held down, and take its rank as one of the most important departments of social economy. This it must do by virtue of the assistance it can and will render the community in the preservation of its unparalleled stock, and no less in the instances alluded to.—*Ed.*]

[THE PARASITIC DISEASE OF LAMBS AND CALVES—
PHTHISIS PULMONALIS VERMINALIS, HUSK, OR] THE
HOOSE.

This disease most commonly attacks young [lambs and] calves during the first year, and generally seizes them while at grass in the summer. In some dry summers it has carried off large numbers, to the great loss of the owners. Upon examination after death, the Author has frequently caused their gullets to be laid open and inspected, in which he has found a *bunch of worms* netted or matted together. These,

Parasitic Diseases of Lambs and Calves. 509

by their continual tickling motion, cause the young animal to be almost in a constant state of hoozing or coughing, by which the powers of digestion are so much impaired as to render the chewing of the cud impracticable. And, if proper medicines are not applied, they languish and pine away like a consumptive patient. All these evils may be prevented with care and proper management.

Worms in horned cattle, we believe, are not very common ; nor do we recollect any instance of the kind, except in the above cases. In many instances where calves have been so bad with this complaint that they baffled the power of other medicines, the disease has instantly given way on their taking one table-spoonful of spirits of turpentine, without mixing it in anything. It may be repeated every third day for three times.

[*Prevalence of the Malady.*—From the utter absence of real knowledge as to the nature of this affection, its prevalence has only been observed during a few years back. The latest works on “farriery” have no reference to it, but comprise, as is too often the case, several diseases under the same head. Few professional works contain details of it ; therefore it is looked upon as a new affection in many quarters. Youatt gives a passing allusion, Gamgee refers to useful foreign writers, and Simonds pointed out valuable additions to the little knowledge extant. Two years ago, Mr. Dickinson, M.R.C.V.S. Boston, Lincolnshire, published a small pamphlet in which we were requested to make observations. With these exceptions no information has appeared, that we are aware of, and we therefore date our acquaintance with the malady as recent—little over ten or twelve years. Since that time its prevalence has been observed to be great, and to recur at certain periods. Three years ago we were consulted in reference to an extensive outbreak among lambs upon Sherwood Forest, Notts, when, from the contemporaneous existence of Cattle Plague,

an opinion was requested to decide the point. It proved to be the parasitic disease, so called. In Northumberland a serious outbreak occurred shortly after, and from the cases submitted we had no hesitation in again detecting the malady. In each case the losses amounted to more than 40 per cent. In Herefordshire, Yorkshire, Oxfordshire, Warwickshire, several counties of Scotland, Wales, and Ireland, as well as in our own and others immediately adjoining, thousands of lambs have died, and many others are suffering at the present moment.

Nature of the Disease.—This affection has been known by various names, as *hoose* or *husk*, *bronchitis*, *pncumonia*, *consumption*, and recently, in consequence of better acquaintance, *filaria bronchiæ* and *phthisis pulmonalis verminalis*. Sometimes it is called *skit* or *scour*, *skinters*, *watery flux*, &c., and is as frequently confounded with and treated as such by those non-conversant with the real symptoms.

Two forms are observed—one in which the parasite is located within the minute structure of the lungs, air-cells, and tubes; the other selects the digestive organs.

In both instances the sole cause of the aggravation and mortality is the presence of the *ovum* or egg of a worm, and subsequently, by their fecundation, myriads of worms themselves. With regard to the nature, development, and migration of these parasites, the remarks—as they appeared in Mr. Dickinson's pamphlet—are as follow:

“Lambs are more frequently affected than animals of mature age, and those reduced by bad or deficient food succumb earlier to the effects. The lungs of sheep are frequently found studded with deposits which are made up of the *débris* of lung tissue, crystalline and oily matter. These are often not larger than the head of an ordinary pin, and hardened as a result of the process of calcification. They are the spots which indicate the deposition of the germ-cells or ova of the peculiar parasite, and the mass around is caused to accumulate by means of the irritation set up by mere presence. The eggs are oval in shape, and of microscopical characters. When fecun-

Parasitic Diseases of Lambs and Calves. 511

dated, a number of cells are formed from the yolk by a process of bi-partition or subdivision, and these, assuming a linear direction, develop the living worm coiled upon itself. After further growth it is liberated from the cell, pierces the tissues of the lungs, and passes into the air-tubes, and commences its work of destruction. From the considerable amount of irritation set up by its presence here, violent coughing is induced, and by this means it is dislodged, and taken up by the young lambs with the grass eaten by them.

“The worm which deposits these eggs in the lungs doubtless also exercises a similar proceeding on the grass, clover, &c. ; they are thus taken up by animals which feed on the pasture subsequently. In either case, the eggs gain access to the digestive canal, in one instance free, and in the other within the worm itself, which, suffering solution in the fluids, sets them free. Some are doubtless matured in the first stomach or paunch, which compartment, in ruminants, offers circumstances highly favourable to the process. They are then carried to the abomasum—the fourth or true digestive stomach—and intestines, where they accumulate in great numbers, coiled closely together, and gather around them a quantity of mucous.

“Whether these ova pass into and are transmitted through the circulatory system, and deposited in parts favourable for their reception, has been doubted and even denied by many persons. Dr. Crisp accounts for their presence in the lungs by direct passage into the windpipe from the mouth, where they have been forced from the stomach during the act of rumination. Professor John Gamgee does not coincide with this view, and justly states—‘the migration from the mouth or alimentary canal to the lungs, certainly requires a more complete explanation than has hitherto been given.’ The same writer also states that ‘Gesner had called a worm *Wasserkalb*—‘calf of water’—of which he knew not the origin, but that calves swallowed them with the water, to the great peril of their lives—*magno-etiam vitos periculo*.’

“The idea entertained of a direct passage of these to the lungs appears to me paradoxical, and in nowise probable. Their migration, I am inclined to believe, is a work of some time ; and hence, as I have frequently observed, the parasites abound in the alimentary canal in large numbers, give rise to aggravated symptoms which terminate fatally when no worms or their eggs are to be detected by the unaided eye, at least in the lungs or bronchiæ. Professor Armatage informs me he has also observed this in many instances. I am also indebted to that gentleman for the following remarks which he gives illustrative of his ideas on the principles which favour the presence of the *strongylus filaria* in the lung tissue :

“‘The presence of *strongylus filaria* in the lungs of lambs and sheep, I think, cannot be explained by any theory which describes—no matter with

what minute exactness and elaborate detail—the unnatural, and, I might add, almost impossible mode of their passing direct through the windpipe to those organs. We all know, as possessing some slight knowledge of physiology, how a hair, bread-crumbs, drop of water, &c., will irritate the glottis or entrance to the windpipe, and give rise to the most painful and convulsive coughing. These are, however, objects of an inanimate character, and irritate by mere presence. How much greater, then, would be the effects of a live worm or worms insinuating themselves on the delicate structures, and especially when the natural barbs or hooklets, as described by Professor Simonds, are put in operation. The supposition, I think, suffers much under the great probability that violent coughing taking place on the entrance of a worm or worms would entirely expel them. If they are expectorated in large numbers from the recesses of the bronchial tubes, they will most assuredly be compelled to evacuate much more rapidly at the entrance to the windpipe.’

“Their access to the lungs may be explained on the same grounds which admit of the presence of *hydatids* in the brain (*cœnurus cerebralis*); the liver fluke (*distoma hepaticum*) in the bile vessels; or the *filaria oculæ*, which sometimes occupies the interior of the eyeball of the horse. While no other organs but the lungs and digestive canal are affected, it is easy to point to an open tube leading to them, and leave them to explain all; but we have no direct communication from either of these organs to the liver, the brain, or eye; on the contrary, the most circuitous and complex arrangement exists, and therefore we must look further for a solution of the problem.

“We must not overlook the important fact that young lambs are principally affected. In them the tissues are more easily pierced, and their passage from the lung tissue to the bronchial tube readily effected. In older animals they remain enveloped within a matrix of cretified substance and metamorphosed lung tissue, in order, as it were, to guard against their effects. If their passage to the lungs were always most direct, the opposite would be the case, and our old animals would die as rapidly as the younger ones.

“The whole matter may, I think, be referred to the physiology of absorption from the *abomasum*—fourth or true digestive stomach—and small intestines. Dr. Carpenter says: ‘It was found by Oesterlen that particles of finely-divided charcoal, introduced into the alimentary canal, could be distinguished in the blood of the mesenteric veins; and similar results have been obtained by Eberhard, and by Mensonides and Donders, not only with charcoal, but also with sulphur and even with starch. There can be little doubt that such substances enter the lacteal system through the epithelium cells of the villi; as the presence of psorosperms in the interior of these has been distinctly perceived by Klebbs.’ The same

Parasitic Diseases of Lambs and Calves. 513

Author also proves by arrangement of the epithelium covering the villi of the intestines, that a distinct passage of oil globules and solid substances takes place from the outer side to the lacteal on the inner side. Kolliker also confirms this view, and quotes Goodsir, Gruby, and Delafond in support of his statement.

"I have also found fully-developed worms within the mesenteric arteries of Shetland ponies, which have died from a combination of causes, for an account of which I refer you to my published papers. The fact is sufficiently apparent, that if such solid substances as charcoal, sulphur, and starch grains can readily pass into the blood-vessels and lacteals, nothing exists in disfavour of the assumption that microscopical ova can be also absorbed, carried through the circulation, and deposited in the tissue which affords the most favourable states for their reception, future growth and development. Seeing this, then, we can safely account for their presence within the lungs, and then follows the solution of their presence in the bronchial tubes, by the process of piercing the tissues after being freed from their cells."

Symptoms.—The location of the parasites in the pulmonary tissue occasions irritation and inflammation. The most violent coughing is produced amid much distress. The animal obtains no relief; and, consequent upon the great obstruction placed upon the aëration of the blood and vital powers, rapid emaciation follows, hectic, and death. Some modifications in these signs occur when the intestines or fourth stomach are the seat of the cause. A vitiated or capricious appetite is soon followed by diarrhœa and gradually increasing depression. Abdominal pains come on, and the diarrhœa becomes very much aggravated. Thirst is most intolerable, and the creature madly laps at anything within reach, taking up mud, dirt, sand, soil, manure, in fact anything which happens to be presented. During the paroxysms of pain the animal stands with the back arched, feet drawn together, and in this position continues to strain, voiding only a small quantity of fœtid dejections, not uncommonly mixed with blood. Emaciation rapidly proceeds, and death in a few days. (Fig. 187.).



FIG. 187.—*Parasitic Disease in Lambs, inducing Diarrhœa.*

Treatment.—It is not always successful to undertake medical treatment in a flock badly affected. Delay makes the danger, and the administration of medicines, of the action of which farmers are naturally ignorant, is only calculated to set up an additional warfare in the system and imperil life. Besides, it is not possible to bestow sufficient attention to every member of a large flock when under devastating disease. Now and then success occurs, but in all cases we recommend *early attention to the first symptoms*, and thus cut short the progress of the malady. It is sound practice to have a rigid examination of the first dead carcase, and determine the exact cause of death. In many instances we have been enabled to stop the further progress of the disease, after properly determining the affair, and when upwards of 30 or 40 per cent. has been already lost, in flocks many miles distant without even seeing them.

The affection is neither hereditary nor contagious, and by attention its effects may be much mitigated, if not altogether banished. Strict attention should be paid to the condition and domestic treatment of the young creatures. Rigid inquiries must be instituted in every case of disease or death, and a definite opinion should be obtained, when means can be safely put in force to arrest the further progress of destruction.

All clovers—particularly second crop—and grass which has been eaten off by older animals should be avoided. Young and sound pastures should be made choice of, which have received at the proper season top dressings of lime, common salt, or suitable artificial manures.

A good practice consists of supplying the ewes and lambs with cut food, as chaff and corn, with pollard, bruised oil-cake, cut turnips, carrots, or other edibles, while they are folded on dry arable land or straw. By this plan suitable medicines can be administered by the food, and much good is effected as well as labour saved. Each animal requires also to receive

medicine by the mouth. Usually three or four doses of the oil of turpentine at intervals of a day or two between each are sufficient. The scientific physiologist knows there is such a means of rendering the system proof against the ravages of the parasite, and thus recommends *early attention*. Prevention is better than cure; nay, further, it is not honest to continue to pour down medicines when no hope of good can be fore-shadowed. Such can only be justified by sheer ignorance of the cause and nature of disease, as well as of the constitution of the animal frame and action of remedies.—*Ed.*]

[ATTACKS OF THE DISTOMA HEPATICUM, otherwise called
THE FLUKE DISEASE—CACHEXIA AQUOSA—ROT IN
SHEEP.]

This disorder has been more fatal to sheep than any other; and, having at different times carried off great numbers, it has occupied the attention of the *learned*, who have favoured the public with a variety of opinions. The symptoms, however, of this fatal disease cannot be more accurately stated than in the following description of Dr. Harrison:

“When, in warm, sultry, and rainy weather, sheep that are grazing on low and moist lands feed rapidly, and some of them die suddenly, there is reason to fear that they have contracted the *Rot*. This suspicion will be further increased if, a few weeks afterwards, the sheep begin to shrink and become flaccid in their loins. By pressure about the hips at this time a crackling is sometimes perceptible. Now, or soon afterwards, the countenance looks pale; and upon parting the fleece, the skin is found to have exchanged its vermilion tint for a pale red, and the wool is easily separated from the pelt.

“As the disorder advances, the skin becomes dappled with yellow or black spots. About this time the eyes lose their lustre, and become white and pearly, from the red vessels of the *tunica adnata* and eyelids being contracted or entirely obliterated. To this succeeds debility and emaciation, which increase continually till the sheep die; or else *ascites*, and perhaps general dropsy, supervenes before the fatal termination.

“These symptoms are rendered more severe by an obstinate purging, which comes on at an uncertain period of the disorder. In the progress

of the complaint, sheep become what the graziers call *chockered*: that is, affected with a swelling under the chin, which proceeds from a fluid contained in the cellular membrane under the throat.

“ In five or six days after contracting the rot, the thin edge of the small lobe of the liver becomes of a transparent white or bluish colour, and this spreads along the upper and lower sides, according to the severity of the complaint. Sometimes it does not extend more than an inch from the margin. In severe cases the whole peritoneum investing the liver is diseased, and then it commonly assumes an opaque colour, interspersed with dark red lines or patches.

“ The upper part of the liver is sometimes speckled like the body of a toad, to which it is said to bear a striking resemblance ; round the *ductus communis choledochus* and hepatic vessels jelly-like matter is deposited, which varies, according to the severity of the attack, from a table-spoonful, or less, to five or six times that quantity. Upon boiling, the liver loses its firmness, and separates into small pieces in the water, or remains soft and flaccid. Several graziers and butchers, with whom I have conversed at different times, having observed that sheep are much disposed to feed during the first three or four weeks after being tainted, omit no opportunity of producing it, to increase their profits.

“ When the first stage is over, flukes begin to appear in the *pori biliarii*, the *ductus communis choledochus*, and in the gall-bladder. At first the quantity of these creatures is small, but as the disease advances they increase, and before death are often very numerous.

“ In the last part of the complaint they are sometimes to be found in the stomach, as well as in the intestines and liver. This, like the visceral disorders of the human body, may terminate in *resolution*, *effusion*, *suppuration*, or *schirrus*.

“ First, the complaint is said to terminate in *resolution*, when the inflammatory action goes off without destroying the state and texture of the parts. However, I am strongly inclined to believe that every considerable inflammation in the human body, and in other animals, although it ends in resolution, leaves behind it some remains, which may be discovered by an experienced anatomist.

“ When the vessels are thrown into inflammatory action for a few days only, *effusion* commonly takes place, and the coats become thicker and assume a buffy colour. These changes in the sanguinary system often continue through life, and lay the foundation of many chronic and incurable diseases. Sheep that recover from the rot exhibit very different appearances after death, according to the severity of the attack ; but the taint is seldom or never entirely removed. I was desired within these few days to look at the liver of an old ewe that died fat, and contained fourteen pounds of suet in her body. The back part of the small lobe was

dappled with whitish spots; the coats of the *ductus communis* and *pori biliarii* were considerably thickened, and more solid than usual. In colour they resembled the human *aorta* in old people, and were full of flukes; in other respects the liver appeared to be sound and natural. The butcher asserted that this was occasioned by a slight taint of long standing, which had not been considerable enough to disorder the economy or impair the health of the animal sufficiently to prevent its feeding.

“Secondly. When sheep die suddenly in the first stage of the disorder, an effusion of serum, or of wheyish coloured fluid, may be commonly discovered in the cavity of the abdomen, and then the peritoneum surrounding the liver is generally covered with a membrane or coat of coagulable lymph. This form of the rot has been frequently confounded with the *Resp*, or *Red Water*, though it differs from the latter disorder in the colour of the effused liquid, in being much less disposed to putrefaction, and in several other particulars.

“Thirdly. *Abscesses* in the liver exhibit another termination of the malady. They are seldom considerable enough to kill immediately; but, in consequence of the absorption of the purulent matter from them, the sheep frequently waste away, and die hectic or dropsical. When the collections are small, sheep will recover sufficiently to bear lambs for three or four seasons, and afterwards become tolerable mutton.

“Fourthly. The most common termination is in *schirri*, or what the shepherds call “knots in the liver.” I have seen the whole substance of this important viscus so full of small roundish lumps or schirrous bodies, that it was difficult to find any sound part in it. The first attack is unfortunately so very insidious, that the disorder is scarcely observable before the animal begins to waste and lose flesh. In this advanced state it is said to labour under the rot, or *pourriture*, from overlooking the commencement of the disorder.”

About ten or twelve years ago the Author of these sheets published a medicine for the rot in sheep, accompanied with printed directions; and as this disease prevailed very much on low grounds, particularly by the Trent side and in some parts of Lincolnshire, he had sufficient opportunity of giving the medicine a fair trial, and had great satisfaction in proving its efficacy in curing this complaint. He undertook many *even in the last stage*, and frequently succeeded in curing *nine out of ten*. Farmers whose lands lie in a low situation, and are subject to this disease, will find the following recipe of infinite value:

RECIPE NO. 161.

Take of nitre, in powder	6 oz.
Ginger, fresh powdered	4 "
Colcothar of vitriol, in fine powder	2 "
Common salt	3½ lb.
Boiling water	3 gals.

Pour the water hot upon the ingredients; stir them, and when new-milk-warm, add to every quart of the mixture three ounces of spirit of turpentine, and bottle it for use.

If this medicine be put in bottles holding from one to two quarts of the mixture, it will be much the better, as the bottles will be more convenient for shaking at the time of giving, which will be found necessary in order to keep the turpentine in a more divided state.

The following directions must be *strictly regarded*: *Keep the infected sheep from food all night: on the following morning give to each sheep two ounces or four table-spoonfuls of the above mixture. (Remember to shake the bottle well at the moment of pouring it out.) To those which are weak and much reduced by the disease, one-half, or three parts out of four, may be sufficient for a dose. Keep them from food three hours after giving the medicine, and then turn them into a dry pasture.*

It will be necessary to repeat the medicine every fourth day for three times, observing the above rules. But where only half the quantity has been administered it will be proper to repeat it every second or third day for six times. Every shepherd should be provided with a small horn, containing just the proper quantity; this will save considerable time and trouble, when it is necessary to give the above drink to a number at the same time.

[During the year 1860 this disease attracted an unusual amount of attention from the prevalence it maintained throughout England.

Professor Simonds refers to many outbreaks from which serious losses have occurred from time to time. As far back

as 1735 and 1736, farmers are reported as having suffered immeasurably. One man living in the Vale of Aylesbury lost 300 sheep in one year, and another sold 100 sheep in Leighton Buzzard market at 6*d.* a head rather than take them home. Another farmer, whose stock in 1810 consisted of 2,000 ewes, hogs, and shearling wethers, lost above 800 by rot alone. A third farmer—a Mr. J. Cramp—stated in evidence before a Committee of the House of Lords, which sat in 1833 to inquire into the causes of the depressed state of agriculture, that in the winter of 1824 the rot swept away £3,000 worth of his stock in less than three months, which compelled him to give up his farm. Notwithstanding the serious losses we have thus been enabled to particularize, perhaps the greatest outbreak that ever occurred in this country took place in 1830-31. It is supposed that upwards of two millions of sheep perished at that time. Evidence of this immense destruction was given by various witnesses before the Committee just referred to, and it was satisfactorily ascertained that in 1833, two years afterwards, “there were 5,000 sheep on every market day in Smithfield less than what used to be the average number, and 20,000 less than usual at Weyhill Fair—circumstances which may assist in showing the enormous loss which had been sustained by the country.” Records of great losses are given from 1830 to 1860, which are of a character bearing upon the wonderful; but I need not dwell upon these, as the history of mortality from rot in sheep is but a repetition of what I shall have to adduce with regard to other diseases at a more appropriate time. In 1862, however, the losses are said to exceed those of 1860, especially in Ireland, and the destruction in England is considered as almost unparalleled in the experience of flockmasters.

Rot is a disease which appears in sheep grazing on low lands, marshy grounds, &c., during wet seasons; but apart from these states, they do not maintain that condition which is desirable

on grass that is soft and watery. The sheep is an animal which thrives best on solid dry food, with a moderate allowance of green food, especially during wet seasons, when even the fluke will be found in the liver of animals that may be slaughtered. Notwithstanding this, if the land receive suitable top dressings, and the animal appropriate medicines, the crisis may be averted.

Nature of the Disease.—Rot is due to the presence of a parasite in the liver, which in technical language is termed *distoma hepaticum*, and in the vernacular, *liver fluke*.

After a number of these are introduced to the organism of the sheep, they become provided with organs of reproduction, and are found in saccular dilatations of the gall-ducts, surrounded by a substance called cholesterine and other solid principles of the secretion of the liver. There they generate ova, which are discharged through the intestines, and being deposited on the land, in ditches, or stagnant pools, are eventually washed by rains into the streams. Fortunately, many are destroyed; but many are hatched and the embryos are developed, being furnished with ciliary or hair-like appendages, which enable them to move over the surface of the water with wonderful rapidity. Afterwards they become the prey of an invertebrate animalcule called a mollusc, in the body of which they undergo a further state of development, becoming possessed of organs of locomotion and alimentary canal, but being still in the hydatid or vesicular form. A process of internal budding appears to take place, and the produce are called *cercariæ* or *larvæ* of trematode or sucking worms—the *distoma hepaticum* or *liver fluke*. They are not unlike a tadpole, being provided with a tail; and, finding their way to water, are devoured by some other mollusc, in which a still further development of their internal organ takes place: the tail is thrown off, and they become encysted, *i.e.*, enclosed in a capsule which is formed by secretion from the outside of their bodies. In this form

they are swallowed by the sheep, still being within the mollusc which was taken from the grass of low meadows, or floating on the water of pools, ditches, &c. In a short period the flukes are discharged from the capsule and escape to the liver, where they acquire organs of reproduction, and accumulate eggs for another generation, which go through the same gradations of change and development as already stated.

Symptoms.—Rot is sometimes speedily developed. A flock placed on wet land, or one which has contracted the disease before being placed there, may appear for a time to benefit by the change ; but shortly dulness and inactivity are observed, and in some instances the disease runs rapidly through its course, proving fatal in a remarkably short space of time, and this even on land which has had the reputation of being of a sound quality. The symptoms are few in these instances, seldom extending beyond a noticeable pallor of the visible mucous membranes. Wasting of the body would thus have scarcely commenced, and therefore be excluded from observation.

Rot, as a rule, proceeds insidiously. The symptoms are then progressively developed and unmistakable. The membranes of the eyes and mouth assume a yellow colour, and frequently also the skin is tinged ; the flanks sink and become hollow, and there is a stiffness or rigidity of the spine ; the abdomen enlarges, becomes pendulous, and presents a strange appearance with the hollow flanks, while the weight of the fluid which accumulates within causes the back to droop or become hollow. Dropsical conditions appear, particularly in the superficial portions, as a result of the condition to which the blood has become impoverished (Fig. 188). The

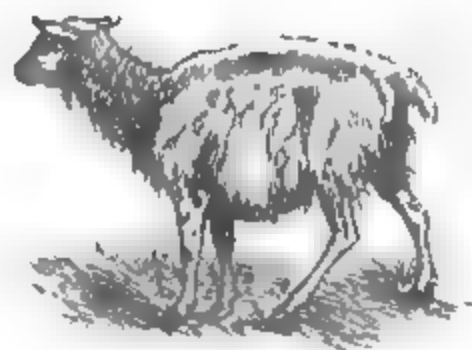


FIG. 188.—*The Rot.*

fleece is detached by slight force, or drops off spontaneously. The pulse becomes small, feeble, and frequent, and peculiar murmurs are heard in the regions of the heart and large blood-vessels, arising from morbid conditions of the blood, only understood by the physiologist. The breathing becomes quick and short, and usually there is a slight hollow kind of cough, which becomes greatly aggravated when *strongyli* are also present in the air-passages, which are not an uncommon addition to rot. Great and aggravated complications now arise. The digestive organs are excessively disturbed. A most depraved appetite exists, thirst becomes intolerable, and intractable diarrhoea sets in; general weakness rapidly increases, and the animals die in a state of stupor and hectic.

Post mortem Appearances.—Great accumulations of fluid are often found within the abdomen. Sometimes the skin and muscles, &c., are yellow. False membranes unite the organs more or less, particularly the liver, which of course suffers most. Flukes are found in the bile-ducts of that organ, varying in quantities; the blood-vessels are peculiarly destitute of blood, and the small quantity remaining in them is thin, pale, and watery, clearly indicating an anæmic condition resulting from an arrestment of the assimilative process.

The *Treatment* of rot consists in an immediate removal of affected animals to sound dry pastures in a more elevated locality, and supplying *moderate* quantities of bruised corn, as peas, beans, or oats, with chaff and pollard. *Small* quantities of oil-cake are highly beneficial. Shelter is also of importance to animals in low condition. Great care is required in these particulars. If good food and warmth are too plentifully supplied, the animals, on recovery from rot, are then liable to be attacked with blood disease in another form, with even greater and more rapid fatality.

The bowels and digestive organs require special attention, and the necessary medicaments are best directed by an expe-

rienced practitioner. They are required to destroy the parasites, give vigour to the system, and render it proof against further invasion. Turpentine, common salt, and preparations of iron are most suitable. Wholesale administration of physic, without the assistance given by a knowledge of anatomy and physiology and the action of remedies, is productive of greater mortality. The object in these pages is to give to agriculturists a better knowledge of the *nature* of the diseases of animals. When they possess this they will be more inclined to value the principles of prevention. The collective sciences which enter into the superstructure termed the Veterinary Art are only acquired by years of toil and study; we, therefore, cannot teach them, nor is it possible to any one to understand them, by only a few minutes' tuition at a time. If such were possible there would be no need of special education. It appears very simple to plough a piece of land, or to play upon a violin; but all must confess that even in them an education is required; and in dealing with a work of nature something more than *hit-or-miss* principles must be observed. We generally find that where disease is supposed to exist, and recovery follows the administration of remedies, of the action of which the prescriber can know little or nothing, the same effect would be observable *without* those remedies. Nature has wonderful powers of her own, and accomplishes more than she has credit given her for doing.

In the year 1862 we saw extensive havoc among large flocks of sheep in Oxfordshire and Buckinghamshire.

There is a tract of low-lying land which stretches from the main line of the London and North-Western Railway Company, at Bletchley Station, and through which the branch line extends to Oxford. This district forms one of the sources of the river Thames, and on each side of the small rivulet lies the material for causing rot in sheep, and even in cattle. On the other hand also, from the rapidity with which vegetation is

sometimes forced after cold rains, particularly in the spring, animals which succeed in living out the murderous attacks of liver flukes are not uncommonly doomed afterwards to a rapid death from *phthisis pulmonalis verminalis*, or *carbuncular erysipelas*, commonly known as "speed" or "black quarter," &c.

By care and attention, however, much may be avoided. It is almost impossible to drain and effectually improve these lands, except by extensive operations conducted under Government: private enterprise would be swamped in the attempt; therefore proprietors should ever be on the alert to husband the animal powers during wet and inclement seasons, by using good and wholesome food, and only such preventive remedies as are recommended by experienced practitioners, by which three-fourths the mortality may be prevented. All districts of a similar character provide this disease, and special measures should be timely put in force.

In Ireland the disease is common. In Scotland thousands die annually. Not long ago, when called to Dublin by the Royal Dublin Society, our attention was directed to sheep in the county of Down suffering from rot. They had been taken across from the west of Scotland, but after a few weeks, when exposed to a damp soil, humid atmosphere, and rather poor pasture, the symptoms developed themselves.

Progress and Duration of the Malady.—This is very variable, depending greatly on the nature of the locality, season, age, condition of the animal, and food supplied. Wherever an action at law hinges upon an opinion as to rot or parasitic diseases generally, it is necessary to go thoroughly into the circumstances which are connected with the previous history as well as sale of the sheep. Nothing should be urged as positive that cannot be proved. Therefore cases must be decided entirely by special merits which attach to each. It may be useful, however, to observe that, among the numerous instances which occur and furnish means for fixing reliable

pathological as well as physiological data, sheep and cattle coming from sound and perfectly healthy districts, and placed upon land favourable to the development of rot, have exhibited symptoms in less than six weeks. In some cases, sheep being driven from one healthy farm to another some miles apart, being allowed to graze on low-lying meadows as they passed but for a few minutes, contracted rot; while others, which were restricted, remained free. Again, where ewes are kept for breeding in "rotting districts" there is great mortality from the great demand made upon the system by the combined effects. Lambs also suffer from the want of sufficiently matured vital power at the early periods of their age.

Instances have been known where an improved kind of keep having been given animals which have contracted rot, the disease has not exhibited itself for six months, or even longer. These facts lead us to decide more thoroughly upon the character of the preventive treatment to be adopted. During inclement seasons, and before the usual winter rains descend, sheep should be removed as far upland as possible, where good food, shelter, with suitable medicaments, may be given with corn, chaff, tares or vetches, turnips, carrots, &c., that will fortify the system against the attacks of the fluke. This only applies, of course, to districts where rot abounds. Land should be drained as much as possible. Under-draining will greatly prevent—and in many places effectually exterminate—rot, and *phthisis pulmonalis verminalis*. It therefore becomes a great, important, and even national question. There are thousands of acres of land which are at present only so many places for favouring the development of disease, but which under effective drainage would become good grazing or corn-bearing districts. Agriculturists, however, are now finding the benefit of co-operation, and will, doubtless, effect many improvements by their formation of district chambers of agriculture—land drainage among many other things coming in for an extended share of attention.

The dressing of grass land also demands attention. It is too much to be feared that parasites are conveyed from meadows in the dry hay gathered from them. The ova again passes into manure, and are more extensively distributed. The use of lime, common salt, and properly selected artificial manures for top dressings should not be omitted; for by increasing the fertilizing properties and counteracting the excesses of moisture, one of the great preventive measures is already within their grasp.—*Ed.*]

GID, STURDY, TURNSICK, &c., technically known as *Cæurus Cerebralis*, *Hydatids*, *Hydrocephalus Hydatideus*, &c., &c.

[As in other diseases depending upon the presence of parasites in some part of the body, considerable light has been thrown upon the nature of "Sturdy" during late years. The affection is well known on the Continent; and, from contemporaneous investigations which have taken place, we are now able to speak positively regarding it.

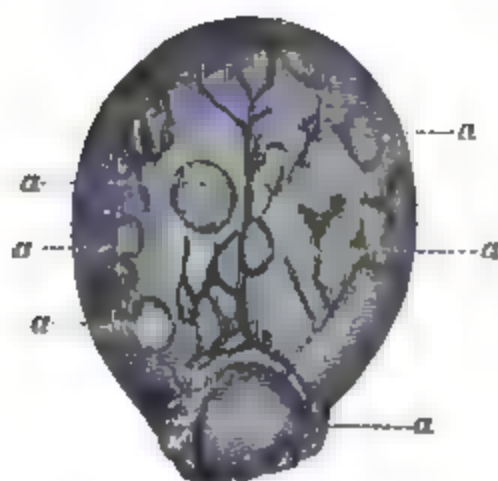


FIG. 189.—*Brain of a Sheep*, Showing a number of Hydatids or Tapeworm Cysts.

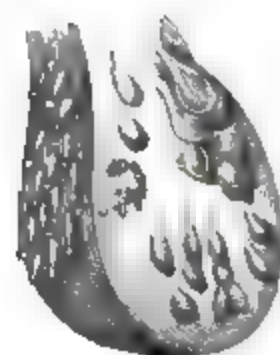


FIG. 190.—*Cyst from Brain of Sheep*, Upon which a number of Eggs of Tapeworm are developed, in various stages, prior to being detached.

Sturdy depends upon a parasite included among the encysted variety of worms which gain admittance to the brain, where it gives rise to great disturbance. It is called a hydatid from

the state in which it is found, *i.e.*, a cyst or bladder containing a clear fluid in which the worm floats.

This disease attacks cattle as well as sheep, but in this country is chiefly confined to the latter animal. Sheep above two years old are seldom affected, the victims being lambs under one year old. It prevails in some districts to a large extent—particularly in Scotland, and especially also upon all unenclosed lands where sheep are herded. Sickly and feeble animals suffer most particularly during the autumn and winter months. On the other hand, sturdy is seldom found on farms where sheep are grazed on enclosed pastures *unattended by dogs*.

A solution of the problem “What has the presence of dogs to do with the prevalence of sturdy among sheep?” has been found to exist in the fact that when these animals are constantly attended by men and dogs, then the ova or eggs of tapeworms exist.

Both partly mature the parasite in their bodies, which discharges an innumerable quantity of eggs from time to time, and are found in the excrement deposited in the fields and beneath the hedges. Afterwards they dry, and are distributed about the vegetation, with which they are taken up by the sheep, enter the circulation, and pass to the brain, as the organ most suitable for their future growth and development. Here they enlarge and invade a substance of the cerebral mass, by which extensive structural changes and functional derangement take place, which usually terminate in paralysis and death.

Sturdy is sometimes confounded with other affections.

The *Symptoms* are, however, peculiar, and unlike those of other diseases ; but complications occur, and modify conditions in accordance with the extent of organ involved. If the hydatid is located in one hemisphere (or half) of the brain, the animal, when caused to move, assumes the habit of turning round to the right hand or to the left as the case may be, describing

constantly a series of circles. When the seat of the worm is between the hemispheres, the animal steps high and goes forward in a straight line, while the head is carried upwards. If the cerebellum or little brain is affected, defective co-ordination of movement is observed, all control over voluntary muscular action is lost, the gait is unsteady and uncertain, and the creature twists and rolls about in a state of utter helplessness. There are cessations of these symptoms at times, which occur from absorption of the brain substance in accordance with the growth of the parasite. The animal appears to recover for a time; but sudden enlargement of the sac taking place produces again all the symptoms with increased violence.

The tendency to run in circles is not always present, but there will be observed dulness, with stiffness of the back, and awkward mode of walking. The eyeball is of a bluish colour, protruded, and the pupil dilated. Sometimes perfect blindness or deafness occurs, and the animal is unable to follow the rest of the flock; he strikes against trees, walls, gates, or other objects, and falls helplessly to the ground.

The addition of symptoms is remarkable when the cerebrum and cerebellum, or greater and lesser brain, are affected at the same time. The head is elevated, but the fore limbs are raised with difficulty and without purpose; one or two steps are awkwardly accomplished, and the animal starts off at a bound, but immediately falls, and cannot rise for some time. After continued struggles and awkward attempts, he succeeds only to repeat the same again and again. Rapid emaciation follows such conditions, and death as a sequel. Relief, however, has been known to occur from absorption and softening of the cranial bones and subsequent discharge of the hydatid; this is, nevertheless, a rare occurrence, as death usually ensues before it can take place.

An operation is sometimes performed for the removal of the encysted worm. This consists of opening the softened parts

of the skull by an instrument not unlike a bodkin having a movable metallic case, and called a *trocar and canula*. The instrument, after being inserted, is withdrawn, leaving in the canula, to which a syringe is applied, and, by its action on pneumatic principles the bladder is extracted. If only one cyst is present this operation may prove successful, but rarely success follows the removal of more. Even in the first instance the animal must be seen early to render the operation of service.

Two years ago we were consulted in reference to a severe outbreak of disease among lambs in Lincolnshire, which afforded much room for scientific investigation. The symptoms of sturdy were not present, owing to the form in which the parasites were found. They were located in the intestines in large numbers as fully-developed tapeworms, specimens of which we succeeded in obtaining rather plentifully. Severe abdominal pains, with diarrhoea, were present, rapidly succeeded by wasting and death. Although great mortality occurred, by the use of proper measures and appropriate medicines further devastation was considerably diminished.

In one of the highland districts of Scotland great mortality occurred in the latter part of 1867 and early in 1868, from tapeworm among dogs. Sturdy was rife among the sheep, some thousands of which, owned by one gentleman, were kept on the hills and herded by many dogs. Cats, and even fowls, also suffered. The symptoms being of a strangely acute and sudden character, afforded reasonable grounds for believing that some malicious person had been administering poison. These animals appeared quite well at a certain time, but shortly were seized by epilepsy and convulsions. One of the collies (shepherd's dog) was walking at the heels of the shepherd, when he suddenly fell, uttered the most piercing screams, and went through the most violent convulsions, which gradually succeeded to insensibility. The shepherd watched with

great attention and tears in his eyes, and, having some distance to go, carefully laid the body of the dog in a suitable place, intending to give it decent burial on his return. He had proceeded several miles among the hills, and, pondering how he could collect his scattered sheep without his faithful dog, sat down to mourn his loss. He covered his face with his hands and shed bitter tears, giving way to his grief only as a Scotch shepherd can at the loss of his collie. While he was thus engaged, he felt something cold touch the side of his cheek, and in the next minute the faithful dog was making the greatest demonstrations of joy, while the shepherd was transfixed, and believed, if it was his old favourite, she must have been raised from the dead. Fits occurred each day in succession, and within a week the poor creature died. Her carcase, with those of four others, were successively dispatched for examination, and in every one we succeeded in finding tapeworms within the stomach and small intestines.—*Ed.*]

MEASLES IN PIGS.

[This affection is variously known as *Cysticercus Cellulosæ*, *Scalesiasis*, *Cachexia Hydatigena*, &c.

The term “measles” is very inappropriate, conveying the idea of an eruptive form of disease externally, whereas in this affection there is nothing of the kind observed; on the contrary, all the effects are internal—chiefly among the muscular structures—in consequence of the developed ova of a variety of tapeworm called *tænia solium* (solitary tapeworm) which infests the bodies of mankind, and that of another from the dog.

Ireland is noted for measly pigs, but perhaps not so much as formerly. This arises from the fact that Irish farmers now breed and feed pigs in greater numbers and in a manner more orthodox: they are not fed singly, and do not live so much in common with human beings—nor are they allowed to wallow

in the accumulations of human excrement, as is too often the case with the pig of the Irish cabin. It is not to be inferred from these statements that the aspect of affairs in the breeding and rearing of pigs in Ireland has changed entirely. There hundreds of these animals still revel in the luxuries of an Irish cabin, where he is the most honoured guest because he "pays the rint;" but they do not form the bulk of those sent to market. Irish farmers have found the pig trade a profitable one, and therefore have adopted the plan of breeding and rearing great numbers of pigs, as well as giving them the undivided luxury of a cabin termed a "pig-stye."

Fed upon fish, flesh, and various kinds of meal, they therefore suffer less—as already stated—from measles, to our greater satisfaction and safety, as Belfast hams and Irish bacons are largely imported here, and find their way into many of the houses of our manufacturing districts and large towns.

The variety of tapeworm we are considering is very prolific. Leuckart says a very few persons affected with tapeworm discharge enough joints to contaminate an immense number of pigs. Each tapeworm has an average existence of two years, and produces during that time at least 1,600 joints, each of which contains 53,000 eggs; making, in all, 53,000,000. Fortunately, many of these, as occurs with the ova of other parasites, are destroyed by various causes, as by excessive drought, or are picked up by birds and swallowed; otherwise the extension of our parasitic diseases would suffer an alarming aggravation.

The eggs of the *tænia* are taken up by the pig in its search for food among the filth and ordure of the roadside, cesspools, and other places. In shape they are nearly spheroidal, being about 1-2666th of an inch in length, and 1-8000th in breadth, and possess armed extremities, with which they pierce their way through the tissues, enter the blood-vessels, and by means of the circulation are conveyed to various parts of the body—

always to that most favourable for the future wants and conditions of the parasite itself.

This process only takes place in young animals. In older ones the tissues possess greater strength, and therefore are not so readily pierced, consequently, if taken up, they do not undergo their usual developmental forms, because they cannot reach the tissues where their special nutrition is provided. They are, therefore, expelled from aged animals, or occupy other organs in their cystoid state, to the danger of life.

In experiments performed for the purpose of proving the migration of tapeworm, all have failed, as a rule, in animals taken above one year old.

After the ova are introduced to the body of the pig several changes occur. The germs are enclosed in small cysts or bladders, and upon each a small rudimentary head appears, with hooks and suckers. This is again enclosed in a cyst which commences at the tail, and by enlargement afterwards encloses the whole body. They grow for a time, and afterwards assume a stationary character—in fact, their term of development, as far as the pig is concerned, is at an end. In his body they remain either until he is slaughtered, or, being sufficiently numerous, produce death by the amount of irritation they give rise to as foreign bodies embedded in a mass of muscular tissue.

When present in the pork they obtain passage to the bodies of men and women in *badly cooked meat*, and become fully-formed tapeworms. In the latter instance the body is usually consigned to some loose and imperfect burial, from which it is shortly exhumed by other pigs or dogs, in which case the eggs of the worms obtain shelter again for a period of time longer before they reach the bodies of mankind.

Pigs are born measly in many instances, and this is one of the great reasons why in Ireland the disease is propagated to such an extent. In France it has been long determined that

measly sows give birth to measly pigs; and these observations have been accurately confirmed in this country. If, however, pigs are born healthy, it appears that two months and a half must elapse before the *cysticerci* can become developed.

Pigs in whose bodies *cysticerci* are present may become fat, and perhaps have never betrayed any signs of illness. The flesh requires very careful examination in order to detect the cysts or bladders, when they may be found in numbers lying immediately beneath the membrane of the mouth, under the tongue, and also beneath the membrane which lines the eyelids. In many cases the muscles below the spine, within the abdomen, are also the seat of measles. Sometimes the throat and neck are affected, when the latter swells very much, the breathing becomes short and difficult, the pig complains with a hoarse voice, and eventually is suffocated. After death the whole muscular system, as well as many internal organs, are affected; and when the pig is cut in half and the muscles of the neck are exposed, the *cysticerci* are found in countless numbers.

Measles in pigs do not prevail to a great extent in England, Scotland, or Wales. In Ireland the disease may almost be considered enzoötic—*i.e.*, indigenous. Here, however, we do not indulge so much in the use of raw or half-cooked meat as in other countries, and to this we may attribute almost an immunity. It has been said that not one pig in a thousand, bred and fed in England or Scotland, is found to possess measles, while in Ireland six per cent. are found affected. But this is probably much below the actual standard of prevalence.

Measly pigs are common in France, and Von Siebold says they are chiefly introduced into Switzerland from thence. The smoked—and therefore only half-cooked—sausages of the Continent, he also says, are very unsafe articles of food. Proper cooking effectually destroys them, and the process should always be put in force.

Although the measles of pigs are said to be the produce of a variety of tapeworm which has been thought to differ from that which causes the gid in sheep (the *cœnurus cerebralis*), there is now sufficient reason to pronounce them identical.

Tapeworms (*tænia solium*) are found to infest the bodies of shepherds; while another kind, supposed to be a distinct variety, infests the bodies of shepherds' dogs—*tænia serrata*—serrated or saw-shaped tapeworm.

Seeing these, it becomes a question if the *tænia solium* of man only produces the bladder in the brain of sheep. The eggs of the tapeworm of man were given to healthy sheep, and these always produced the cyst in the brain, and all the symptoms of sturdy.

These bladders or cysts were next given to healthy dogs, and in them were produced the tapeworm peculiar to the dog (*tænia serrata*). This was, however, not sufficiently conclusive, and therefore the experiments were conducted in a negative manner, and repeated always with the same results. *Tænia serrata* of the dog were found also to produce the gid in sheep equally with the tapeworm of man—this proved their identity. Further, the *cysticerci*, or measly cyst of pigs, being found to produce in man *tænia solium*, was also found to produce in dogs *tænia serrata*. The conclusion, therefore, is that the *cœnurus cerebralis* of sheep and the *cysticercus cellulosæ*, or measles of pigs, are but various conditions in the development of one tapeworm, but which assumes the property of possessing slightly modified appearances in the mature form in man and the dog.

In Abyssinia the tapeworm abounds very much. The native views the matter as one of essential importance to his well-being and happiness, and if he expel no tapeworm joints he considers his earthly career almost at an end. When a slave is sold, the purchaser invariably receives, as part of the transaction, a packet of *kousso*, to remove his tapeworm.

The occurrence is due to the large amount of raw meat which is consumed. This is very apparent from the fact that where no flesh is consumed tapeworm does not exist. Reinlein, a physician of Vienna, attended the Carthusian monks, who never partake of meat or milk, but live mostly on fish, and he says neither during his long period of attendance, nor in the memory of the oldest fathers, had the presence of tapeworm been proved.

Several cystocestoid worms also infest the bodies of rabbits, hares, polecats, cattle, wolves, and even horses. In the liver, spleen, and sometimes the kidney, we find the hydatid or cystic form of some worm or other, and it is very reasonable to suppose that in many instances there is no little connection between these and the varieties of tapeworm we have been considering, as well as one or two others which are now and then found.

It has also been observed that after animals have suffered from protracted disease of the heart, a *post mortem* examination has revealed the presence, in large numbers, of the cysts of tapeworms, forming large tumours within some of the cavities or the pericardium. Such a fact speaks strongly in favour of making careful examination of the bodies of animals after death, in order to institute proper means for the preservation of others living, that may become affected.

In returning to the consideration of sturdy in sheep and measles in pigs, with a view of pointing out remedial measures, we may be permitted to remark that, after what has been adduced as stamping the correct nature of these affections, the course through which the parasites pass in order to fit themselves for the localities they occupy in the living organism, and the extended character of the whole question, something more than a mediocre or superficial kind of intelligence is required. It is very easy to build on a foundation which has already been laid, but few are sufficiently honest to admit their super-

structure is dependent upon conditions which they have had no part in organizing. In this way true science is deprived of much of its glory; quackery stands forth with its brazen trumpet, and unblushingly quotes falsehood to mystify, instead of explaining, the real state of affairs. It robs and cheats under the most attractive and fictitious titles, and places success at the most opposite and inaccessible limits. Illiterate brains pirate ideas, and, without the will or the ability to wait further completion and proper application, turn it to a commercial account, and verify the old proverb that "one-half the world lives by deceiving the other." In this way truth and honesty are put to the wall. The public ear is charmed by sounds which cost them the least trouble to interpret, and they submit quietly—as a condition which only ends with their life—to have useless expenditure imposed upon them, and to pay as dearly for their whistle as possible.

A liniment empirically applied to a painful joint, originally intended for a different purpose, and attended by a disappearance of symptoms, which rest and sensible abstinence would as effectually have dissipated, gains a wonderful notoriety. An internal remedy under similar circumstances is deemed a cure for everything, and hundreds rush to write their testimony of a false and uneducated belief. Cause and effect are ignored. The animal organism is no longer deemed the "harp of a thousand strings," but a clumsy automaton or inanimate machine which will bear all the mutilation that the ignorant, unwise, and mercenary may think proper to apply. In this way animals are loaded with distasteful and even dangerous drugs, which deteriorate flesh and half-poison human creatures, when a calm judgment and rational acquaintance with God's works would dictate a more careful domestic management. Rude interference is prompted by a desire to become surgical when Nature cries aloud for justice in the stable and cow-shed: she is driven from her home when her pleadings are the most

intense for simple comfort, and obstructed in her movements when the greatest and most noble results are on the eve of completion. Such are some of the tendencies of quackery. There are a great many others which will find a place in connection with our remarks on other affections, and we may not expect the evils will be diminished while such little knowledge exists of the true nature of maladies, and the danger of using things which truth and honesty declare inappropriate, and prompted only by a desire of gulling the public and living upon their losses.

From these principles have arisen great inconveniences. For a long time sheep affected with sturdy were believed to be suffering from totally distinct diseases. Pigs affording evidences of measles were also equally misunderstood. The reasoning of shepherds and cowherds, with all the quacks in their train, failed to do more than recommend physic, which is the nearest allied to their profits. Animals suffered partly from the disease, but frequently more from the drugs employed. Devastation continued on every hand, while the empirics sat in conclave at the nearest pot-house, and gloated over the proceeds of their unchangeable and wholesale administration.

The drenching-horn, with the inevitable pipe and glass, has given way to more rational and scientific objects. The hand which wielded these was found unsteady and unpractical where deep thought and weighty judgment were demanded. The scalpel or dissecting-knife has sought out with accuracy some of the most intricate parts of the organism, and revealed facts which declare the blind obstinacy and stupidity of the past; and those which the knife has failed to reach have been demonstrated by eyes and fingers trained to manipulate with the microscope. In this way new truths are being constantly developed.

From the recesses of the dissecting-room, laboratory, and

study of the man of science, the oft too-much-despised theory has arisen and terminated in the most practical and beneficial results.

Miles away from the sheep of the hills or the suffering cattle of the fertile plains, men have worked late and early to solve the problem upon which the obtuseness of benighted generations failed to throw the least ray of light. Hundreds of pounds have been expended in the most searching investigations, and experiments to prove or confirm them, and the result is truthful demonstration that veterinary science does not essentially consist in the administration of remedies, but in the correct application of human knowledge to an investigation of the *cause* and *nature* of disease among the lower animals. If this interpretation had not been obtained, results would be more mischievous than they are at the present time. The nature of parasitic diseases having been clearly and definitely settled, we no longer attempt to remove the parasites from their holdings in their different organic structures by agents which fail to reach them, but undermine still more the constitution of the creature infested by them. The condition of the parasite in sturdy and measles, hydatids of the liver, spleen, or kidney, &c., is well known to be one of the most inaccessible characters. The whole system may be impregnated and even poisoned with drugs, but still the cysts of sturdy and measles will remain in utter defiance, and, after the death of the animals, may be taken and propagated in others with success. If measures are directed to the destruction of the parasite in its cystic form only, success will be the most remote, trouble and anxiety will be endless, and expense enormous. With the first appearance of disease, affected animals should be summarily dealt with. The bodies of measly pigs are not safe as human food, because, by propagating the developed tapeworm in the digestive organs of the human subject, serious consequences are likely to ensue. Sheep

affected with sturdy, on the contrary, are not dangerous, as the diseased portion is the brain only ; therefore, if the head be removed, the carcase is wholesome. Meat of all kinds should be well cooked, but particularly pork, and that coming from unknown sources should be dealt with under extreme caution to avoid the consumption of any raw or imperfectly cooked parts. A flock of sheep having members affected with sturdy should be carefully watched, in order to detect fresh cases, and each animal should be quickly slaughtered, before wasting and emaciation proceed, and render the carcase worthless.

It is to the origin of the parasites that measures of prevention are the most applicable and attended with the most useful results. Pigs should not be allowed to live in, or too near, human habitations, nor wallow in all kinds of filth in their search for food. With proper sanitary measures, the removal of manure, &c., and treatment by chemical agents in order to fix its natural properties, will go far to prevent the distribution of the eggs of animal parasites generally, as well as destroy their powers of fecundation, and in this manner limit their destructive effects. Shepherds' dogs also should have special lodgment apart from human beings, and receive regular attention, in order to destroy the tapeworm which almost always infests their bodies, and the eggs of which, by subsequent discharge, produce the effects we have described. A more extended view of these affections would probably point out the necessity for confining shepherds' dogs when off duty, and supporting them with a stereotyped diet, so as to avoid the possibility of their contracting tapeworm. This would, however, fail entirely. The dog is an animal designed by nature to live upon carrion and refuse generally, which he delights to seek and prowl after in his natural and peculiar fashion. Such a mode of life is most consonant with his health, and if he were fed upon the best indoors for half a lifetime, even if he had never tasted carrion, the first occasion on which his liberty is given, he will devour

with relish the most disgusting masses of putrid flesh that come in his way. It must prove very annoying to the fair owners of pet dogs when the creatures will run, in utter defiance of calls and threats, and leave the sumptuous meals of milk and mutton—to say nothing of the numerous nonsensical fancy dishes which refined but superficial notions of canine propriety improvise—to seize the most disgusting filth of the road with true canine delight, swallow it with intense satisfaction in having done something in accordance with nature, and afterwards roll upon the spot in order to perpetuate a lively recollection of the *morceau friande*. Such, however, dogs of all kinds will do. The practice is no irregularity, but designed by nature, and therefore shepherds' dogs, being no exception, faithfully carry out the instincts with which they are endowed. In spite of every precaution, they contract tapeworm in many ways, and require more than ordinary care.

If dogs were properly watched and put under treatment at periodical times, the tapeworm could be expelled or destroyed by force, and thus the discharge of joints impregnated with thousands of eggs be necessarily limited. The excrement of dogs so treated should also be destroyed—the most reliable agents being strong acids, as oil of vitriol, &c., or, what is perhaps more convenient and inexpensive, it should be thrown into the fire.

The carcasses of pigs *dying* from measles—and sheep *dying* from sturdy—*should be buried very deeply*, and covered with caustic and quicklime, and pastures upon which these animals may have been should receive, as soon as possible, ample dressings of chemically prepared manures, particularly those in the composition of which the mineral acids enter rather plentifully. Shepherds and attendants upon pigs should be induced to place themselves under medical authority when they are suffering from tapeworm, and also cautioned to observe habits of regularity and cleanliness, and thus, as far as they

are concerned, diminish the tendency to distribution of the parasites.

Here it may be asked, How are proprietors to judge when parasitic diseases affect their animals, and upon what principles must they act in order to mitigate the aggravated conditions? It is not expected that agriculturists can become their own medical advisers, and particularly in such cases as those we have been considering. The symptomatology of disease may be very plain in some instances, as in colic, for example. Most people believe they can comprehend the evidences of pain; but pain is not always manifested in the same manner. They are liable to mistake the cause, and resort, under those circumstances, to the most absurd and improper remedies. Among young children there is frequently much suffering from indigestion, which proves very troublesome. As a rule they are born healthy: the poor little things have not the same facility as the adult, which consists in framing an excuse for the pain in a sluggish or torpid liver, the result of intemperance, or at the least self-indulgence. The young child receives all kinds of slops and messes; irregularities occur in the quantity and quality of food; the stomach is disordered, pain is manifested, and treatment follows as a matter of certainty. So common are the cries of pain from such disorder, that every "Sairey Gamp" of the profession knows the exact cause, and at once dives into the recesses of the cupboard or her pocket for the appropriate remedy. Gin, peppermint, and other spirituous liquors are the stereotyped medicines, and "*can do no harm if they do no good.*" What a mistake! However, with the usual dogmatism, these are accepted and employed. Daffy, Godfrey's Cordial, and other soporific mixtures are called in to supplement the warfare already created within the frail organ, and thus the dosing goes on. Some time ago a child—as many have done before—quietly left this earth after hours of suffering from pain which all the favourite remedies had failed to

alleviate. Dose after dose had been given, and the sleep which followed proved the sleep of death. An examination succeeded, and events disclosed that the child had been *veritably poisoned by opiates and spirits; but the cause of the pain was a large pin which had penetrated the flesh to a considerable distance.*

Our domestic animals suffer in the like manner. Their symptoms are mistaken, and the dabbling propensity prompts the administration of all kinds of poisons. The remedy for this misguided practice is a proper knowledge of animal physiology. Such principles, which ought to form a branch of education, would enable the agriculturist to detect the earliest symptoms of disorder, teach him that science improperly or imperfectly applied, and dabbling with agents, the action of which is not understood by him, are but forerunners to expense, loss, and disappointment. If the farmer knew more about the animal frame and its wonderful functions, he would respect it more, save hundreds of lives that now are lost, and *he would also be a more fitting judge of the capabilities of those whom he employs as veterinarians.*

First learn to ascertain the *cause* of disease and its *nature*. Then remedial measures may follow with precision and purpose. When animals suffer from disorder or disease, attend to the *first* signs before they are aggravated and supplemented by others. When death occurs suddenly, let the animals be carefully examined by competent persons, and if such are asked they will map out principles, which shall mitigate, if not destroy, the causes which end in so much loss and vexation. If this were made a rule, parasitic diseases could be controlled in a most remarkable manner; and be it remembered, that while we concentrate our endeavours to protect our flocks and herds, the more we can lessen disease among them, the more animal food we shall have, and at considerably lower prices. By a system of rigid examination into the origin and nature of disease, great mortality may be saved.

Pounds are squandered by useless doctoring, when a *post mortem* examination would point out a rational mode of prevention for a few shillings, and no one has demonstrated this more truthfully than the flockmasters and shepherds of Great Britain.—*Ed.*]

THE SCAB.

The scab is a disease that is very common in this part of the kingdom (Nottinghamshire), though not so prevalent as in many parts of Lincolnshire. This disorder is *contagious*, for if one sheep be infected with it, it will quickly communicate it to the rest of the flock, and can seldom be entirely eradicated without the whole flock undergoing a general salving.

Too much caution cannot be used by the grazier in first introducing sheep, which are purchased from other districts, among his own flocks, lest any of them should be infected with this disease. The scab requires but little description, being so well known to most persons who are accustomed to the care and management of sheep. It is first discovered by the animals rubbing themselves against every post, gate, bank, or any other convenient place suitable for the purpose, and they are frequently seen to pull off the wool with their mouths.

This disease appears to be of the *cutaneous* kind, and only affects the skin with a scabby eruption; but if permitted to remain without attempting to cure, it will enter the system; and unless great care be taken, the sheep will sink under its pressure.

Formerly, this disease was cured with a strong decoction or infusion of tobacco in a certain quantity of water, and at the time of using a small quantity of spirit of turpentine is added. Others have dissolved an ounce of sublimate and two ounces of crude sal-ammoniac in one gallon of the above infusion. This medicine will cure the scab in sheep; but being of a dry

and harsh nature, it is detrimental to the fleece. The scab often remains on the afflicted pat for a considerable time after dressing with this medicine in a corroded state, which entirely prevents the wool from growing, so as to be of no use for that season. The ointment is a proof of its great superiority over all washes, not only in curing the disease, but in causing the scab to shell off and the wool to grow, and likewise in promoting their health. It is prepared in the following manner :

RECIPE NO. 162.

Take of (mercury or) quicksilver	1 lb.
Venice turpentine	$\frac{1}{2}$ „
Spirit of turpentine	2 oz

Work them well together in a marble mortar until the mercury is thoroughly incorporated, which may be complete in the course of five or six hours ; then take four pounds and a half of hog's lard, melt it over a slow fire, and, when new-milk-warm, add it to the quicksilver, and keep it constantly stirring until it grows stiff.

The labour necessary in making this ointment may appear to some persons very considerable ; but the *quality wholly depends on the perfect union* of the quicksilver with the other ingredients. If requisite, the person may make four times the quantity in nearly the same time by working it all together in a large marble mortar, or in an iron pan (of sufficient capacity to hold the whole), with a wooden pestle five or six inches broad, and made suitable to the bottom of the mortar or pan.

Shepherds in many parts of this kingdom have but little knowledge of the proper method of using this ointment, for want of which the life of the animal is often in great danger. It will therefore be necessary for every shepherd, and others having the care and management of sheep, to know the proper quantity that may be used with safety.

One pound of the ointment is sufficient to dress *seven* sheep of a moderate size for scab ; and if slightly infected it will

suffice from that number to *ten*. Many farmers and graziers are in the practice of dressing all their sheep and lambs every year, whether infected with the scab or not. They allege that it destroys filth, promotes health, and causes them to thrive much faster. The quantity generally used for such sheep as are not infected with the scab (but merely with the view of keeping them free from that disease and from filth), is generally *one pound* of the ointment to *ten* sheep.

The ointment should be neither too *stiff* nor too *thin*: if the *former*, it cannot be properly rubbed on the part; and if the *latter*, it is apt to *run off* and be of no use. A moderate consistency, therefore, so far as to spread freely, is preferable, which may be regulated in the following manner: If the ointment be made during the *summer*, when the weather is warm, it will be proper to leave out one pound of lard and add one pound of black resin: dissolve it in the lard and add it to the mercury: this will stiffen and make it of a better consistence.

The method of using this ointment is as follows:

Divide the wool on the back from the head to the tail, so as to expose the skin, then take a small quantity of the ointment intended to be rubbed on the sheep, and rub it well in upon the skin from head to tail. Next divide the wool on each side, and rub the remaining part of the ointment well in. This is the general method made use of either in dressing of sheep for the scab or filth. But different shepherds adopt various ways, some thinking it necessary to divide or furrow the wool down each shoulder, and likewise on the thighs, or on any part that may be infected with the scab.

The most *proper time* for dressing sheep with ointment is about *Michaelmas* or any time in the month of *October* choosing dry weather for the purpose. But this is not always the case. The farmer often neglects to dress them at the latter end of the year, and in the spring he frequently finds his

sheep infected with the scab. Now, they should not be dressed for this disorder too *early* in the spring, but should be allowed to gather a little strength, and if the weather be dry and fine, it should not be suffered to pass.

[This is, perhaps, one of the greatest sources of annoyance and loss to the flockmaster. From the continued violent irritation to which sheep affected with scab are subjected, any improvement in condition is a total impossibility; ground is occupied and food extensively consumed, labour is engaged for which payment is required, but the loss of condition continues unchecked. In addition, further trouble and annoyance arise from the uselessness or damage accruing from various remedies adopted. Sheep continue to suffer after repeated dressings, and serve to contaminate every pasture, post, gate, or building with which they come in contact, and thus gain for the disease a station in the locality (Fig. 191). On the other



FIG. 191.—*Sheep affected with Scab.*

hand, sheep may be relieved by the dressings of mercurial ointment, dips of arsenic, corrosive sublimate, &c., but the symptoms of poisoning soon appear, and this remedy proves worse than the disease. All this time the suffering animals have rubbed themselves constantly, and the wool is almost cleared from their bodies—a loss to the owner in many cases equal to the value of the flock after the general condition has been reduced.

Scab is purely of a local nature, and due to an insect which

attaches itself to the skin, and in the movements necessary for the purposes of its life produces violent irritation, destruction of animal tissue, suppuration or formation of matter, ending in a subsequent incrustation over the affected parts. It is due to the last circumstance that the term scab has arisen—an abbreviation of the more scientific and technical term *scabies*.

In man the analogue of this disease is termed "itch;" in the horse and lower animals generally it is known as "mange." In all these it is *purely contagious* and *propagated only thereby*. It is never capable of arising spontaneously, and never is or can be influenced by atmospheric causes, latitude, altitude, or humidity or dryness of the season. Whenever supposition arises which favours the idea that such agencies produce effects which vary the origin and progress of contagious diseases, it can be based only upon a deficient knowledge of the nature of these maladies. If the shepherd and empiric had been less resorted to during the past fifty years, and veterinary science *expected* to furnish information upon these questions, at this day we should have less of scab and other contagious diseases, and mutton and beef of our own growing at much lower prices, of better quality, and far more remunerative to the British farmer. Amateurs in scientific matters seldom make much profit or progress. With every man to his trade and proper division of labour we gain the only correct principle—success.

There is a common belief that when animals are reduced in condition and become very lean and weak, they are likely to contract mange, itch, or scab. They may be weak, ill conditioned, dirty, subjected to every condition of filth and ill ventilation, but that is no rule to establish the inevitable contracting of contagious parasitic diseases. There must be some means by which the cause is transmitted, or the disease cannot appear. Condition may be the reverse of health, but that alone does not create a certainty by which scab can be contracted. Poverty and ill health can never ensure it, but such may enable the

animal to *take the affection more readily*. This obtains in all animals.

Another peculiarity exists: this is the mode in which contagious parasitic diseases are conveyed. The insect, commonly called an *acarus*, which gives rise to scab, may be conveyed by men and dogs from one farm to another, but neither the men or dog which convey it will suffer but in a very slight manner themselves. It is essential for the proper development of such affections that the insect conveyed is the one proper to the animal. Thus the variety which infests the horse may be conveyed by dogs, cats, or the human subject. It may create some slight amount of irritation upon each, and eventually be taken to the sheep on the same farm, or others at a great distance. This does not produce real scab. The insects which produce mange in horses, dogs, cats, &c., are different species of the same order, and will not produce scab in sheep. Nor will the itch insect of man produce mange in dogs or horses, or scab in sheep. Each animal, therefore, which suffers from *scabies* or mange can only contract the disease when the insect peculiar to the genus is at hand. Thus the insect which produces mange in the lion will produce the same in the tiger, cat, and other feline animals; that which affects the dog will also affect the wolf and fox, &c.; that of the horse will also attack the ass and zebra; while that of the ox will be found upon all bovine animals affected with mange.

Mode of Conveyance.—The most common means by which scab is propagated among sheep in Great Britain is that of importation from abroad. Poland and Friesland, as well as some parts of Holland, are stations for this disease; the latter country drawing her supplies from the two former. The periodical introduction of affected animals serves to perpetuate the disease and preserve its activity, which otherwise, by judicious and suitable treatment, would be entirely banished from our soil.

Another cause of the propagation of scab is the congregating of animals in markets. Those diseased are placed in pens or stances which they contaminate, and the next which come, of course, contract the affection. Wherever they go they spread the eggs of the parasite, and thus flocks which travel the highways are continually in imminent danger. From this cause farmers in many districts, having now become sensible of the danger of taking their cattle and sheep to markets, either prefer to sell them at home, or, if they have been exposed in a public market, dispose of them at a sacrifice rather than take them back, and with them also a contagious disease.

When sheep are accumulated largely on unenclosed lands—as the Wiltshire downs and similiar tracts of country—over which there are “driftways” or bye-roads to large towns, scab is not uncommon. Until the fact was looked into, it was believed this disease was generated by soil or climate. When small-pox among sheep also made its appearance, the prevalent ignorance of contagious affections also gave rise to similar inaccurate conclusions. Investigation, however, proved in both cases that each had a remote origin. Drovers make use of these downs as bye-roads or “driftways,” and pass over them in order to avoid the tolls of the high road. Their scabby sheep and others having small-pox disseminate the germs of contagion over the grass, and not unfrequently mix with the native sheep, and thus make contagion doubly sure.

The *History* of scabious diseases dates as far back as 1,300 years before the Christian era; but the accounts are so vague and ill defined that their association with certain animals fails to afford reliable data for scientific discrimination and treatment. The disease of one animal was frequently supposed to be communicable to others of an opposite genus—as from the horse to the sheep. This does not agree with later investigations, and has been proved to be decidedly erroneous.

Nature of the Parasite.—Three varieties of the scab or

mange acarus are observed. Gerlach, an authority on the subject, places them in the *class* Arachnida, *order* of Mites or Acari, *sub-order* Crawling Mites, *family* Scarcoptes. The first are called *scarcoptes*, that burrow in the skin; the second, *dermatodectes* that simply bite and hold on to the skin; and the third, *symbiotes*, which live together in large numbers, but do not pierce farther than the cuticle or outer skin. These



FIG. 192.—*The Scab or Mange Insect.*

animals bear a great resemblance to each other, their points of difference being in size as well as form and number of their suckers. The male is much smaller than the female, and does not occasion the same amount of destruction. The female, on the other hand, is larger, congregates in immense numbers, and breeds rapidly, one male being sufficient to fecundate many females. The life of the female is short, usually not extending beyond the time required for bringing forth her eggs;

but the male is longer lived. From this cause the acari which move about in the skin the most are females in search of the male, food, or suitable places, as the furrows of skin, in which to deposit her eggs. After this she dies. In three days, or thereabouts, the eggs are hatched; and it is calculated, from decisive experiments, that from one pregnant female acarus six generations were obtained, and these numbered *one million females* and *five hundred thousand males* in ninety days. This explains how quickly the scab of sheep is propagated, and how essential it is to be observant of cases where the affection is known to exist.

Pastures, buildings, yards, sheds, pens, &c., in which scabby sheep have been placed, retain their contagious properties for some time. If the weather be hot and dry the acari left behind suffer from shrivelling up and drying, and from three

to eight days is required to destroy them effectually; but if the atmosphere be moist and warm they will retain their vigour and activity even after a much longer period.

Legislation in reference to Scab.—By an Act which was passed in the reign of George III., it was made penal to depasture sheep with scab in any open or unenclosed pasture land. By the 11th and 12th Vic., cap. 107, it is enacted that infected sheep exposed in public market be seized by the authorized inspector, and destroyed—together with pens, hurdles, litter, &c., with which they have been in contact. Any person knowingly exposing infected animals is liable to a penalty of not less than twenty pounds, and a like sum is exacted for depasturing the same on open or unenclosed lands. Provision is also made for dealing with animals affected or dying with contagious maladies, purification of stables, &c., and enforcing penalties under local authority. Since the passing of this act in 1848 several additions and amendments have been made, which are, successively, 16th and 17th Vic., cap. 2 [otherwise the Contagious Diseases (Animals) Act, 1853]; 29th and 30th Vic., cap 15 [the Contagious Diseases (Animals) Act, 1866]; and 30th and 31st Vic., cap. 125 [the Contagious Diseases (Animals) Act, 1866]. Our agricultural readers would do well to provide themselves with copies of the Act of 1869, by which much useful information would be derived, and probably trouble and even litigation avoided. It is not unlikely that we shall hear more of actions being brought to recover for loss and damage arising from exposure of scabby sheep in our markets, as the disease is rife at present in many quarters, particularly around the metropolis.

It may not be generally known what an “infected animal” really means. From an ignorance of the exact interpretation of the term arise most of the great omissions and mistakes connected with contagious diseases. There is no intention to imply that an animal “infected” is one absolutely diseased.

It may be in perfect health, yet capable of communicating contagious disease to another. *The term is used to denote animals coming from among a number of others in which one or more are diseased.* To expose in a public market, therefore, sheep not diseased, but having come from a flock having scabby sheep among them, or from farms, buildings, pastures, &c., where such have been but recently, is to expose infected animals; and on proof of the fact before a magistrate, conviction would follow.

Mortality from Scab.—Sheep affected with this disease do not usually die in consequence. It is too common to attempt to cure the affection, by which the prevailing irritation and effects upon the constitution are somewhat allayed; but shortly symptoms of a different character set in, and death ensues—*not from scab, but from the dressings employed.*

This fact is not generally understood, a supposition being entertained that the disease is one of the eruptive forms which indicate severe internal and constitutional disturbance, from which death arises. Great emaciation ensues as a result of irritation, and the deaths that occur are in the proportion of 95 per cent. from the remedies, but from the disease not more than two to five per cent. The great desire to keep such matters secret materially frustrates the progress of science in all attempts to provide suitable and efficient remedies. Agriculturists stand much in the way of their success in such matters: if they would court more inquiry in them, their profits would exhibit a correspondingly increased and permanent aspect. We shall have occasion to refer again to this shortly.

MANGE IN CATTLE.

This is not of very common occurrence, particularly among dairy stock and that of well-kept farms. The cattle of low dealers and others who travel much and frequent third-rate

markets with inferior and half-starved animals, are generally affected, and by them the disease is conveyed from place to place. As in sheep, the disease is propagated by contagion, and frequently the parts first affected are the face, head, and neck, as a result of the animals' smelling and manner of approaching each other. Sometimes other parts may exhibit the disease earlier, as a direct conveyance of the parasite would imply.

Mange in cattle varies slightly from the scab of sheep in the appearance presented. This arises from the presence of wool in the latter animal, shielding the parts from attrition, and furnishing greater protection to the acari during their depredations on the skin. The insect is said by Gerlach to be the *dermatodectes bovis*, which pierces the cuticle, but does not burrow.

Mange in the Pig is frequently severe when it attacks that animal, owing to the burrowing parasite, *sarcoptes suis*, being conveyed. Great irritation occurs, the animal rubs violently, and pustules form, which run into each other and, as in other animals, dry up, leaving an incrustation which forms the scab. An erythematous inflammation is the result, which, by a continual presence of the exciting cause, suffers aggravation and extension, the suppurative process being established.—*Ed.*]

SHEEP LICE, TICKS, [AND MAGGOTS].

Sheep of every description are liable to these kinds of filth, but more particularly such as are in an unthriving state. They in every respect appear to be constant attendants on sheep that are struck with poverty. A description of them is almost unnecessary, as shepherds and others accustomed to sheep must have a knowledge of this kind of vermin.

The louse is of a brownish colour and a flat make, having three legs on each side of its head. Ticks are nearly of the

same make and colour, excepting that they are considerably larger. They are of great detriment to the sheep, prevent them from thriving, and cause them to scratch or tear off their wool by rubbing themselves against fences, and sometimes they will tear it off with their mouths, to the great injury of the pelt and fleece.

In order to destroy these noxious vermin, a number of different applications have been employed ; but in most parts they have been superseded by the use of the mercurial ointment ~~used~~ for the scab. There are, however, in different parts of the kingdom persons who still practise the old method of dipping their lambs at the latter end of the year in a solution of arsenic, made after the following manner :

RECIPÉ NO. 163.

Take of white arsenic, in powder.....	2 lb.
Pearlash	$\frac{1}{2}$ „
Soft soap	4 „

Put them in a large tub, and pour from fifty to sixty gallons of boiling water upon the ingredients : this may be done overnight, and it will be fit to use the next day when cold.

The lambs or sheep may be dipped or immersed in the solution, taking care the *head* be sufficiently kept above the water : the sheep must then be put into another tub, and the liquor pressed from the wool with the hands, and returned into the former tub for the remainder. By this method a considerable number may be done in a short time. But one pound of the ointment (No. 161, page 544) will be sufficient to dress *ten* lambs, and if properly rubbed on will destroy all the filth that may be found upon them.

[The scab acarus is not the only insect that infests the fleecce of sheep. There are others also that produce great irritation, interfere with the rest, prevent the growth of flesh and fat, and cause the animal to rub itself violently, to the great detriment of the fleecce.

Sheep Lice, Ticks, and Maggots. 555

First we have the common sheep louse—*trichodectes sphærocephalus*; second, the red louse—*melophagus ovinus*; third, the common sheep tick—the *ixodes reticulatus* of naturalists—commonly called also “fags” and “keds” in different districts; and fourth, maggots. The three last are the most troublesome—setting aside the scab insect. The red louse is a species nearly allied to the tick, and both are blood-sucking parasites. Armed with sharp claws or hooks on their extremities, and furnished with a proboscis or sucker, they dig into the flesh, and such is their tenacity that the body in many cases may be pulled in two before they will quit their hold. They not only cause irritation, but impoverish the blood of the sheep. They crawl about on the skin, and are continually seeking fresh places for support, while the sheep rubs violently against all stationary objects in vain attempts to dislodge them.

The *Lice of Cattle* are as follow: The calf is infested by a distinct kind of louse, called the *hæmatopinus vituli*. The cow suffers about the anus and vulva, as well as thighs and perinæum, from a distinct species known as *hæmatopinus ani et vulvæ*; the region of the shoulders is attacked by another variety, called *hæmatopinus eurysternus*. With these also are associated *trichodectes scalaris*, a different genus from the above. These parasites are usually treated with the poisonous ointments and washes made up for scab in sheep. Such, however, require great care, as the animals are apt to lick themselves, and thus carry poison to the mouth. The non-poisonous washes for sheep when properly concocted are equally useful. Dressings of oil, afterwards washed off, are sometimes effectual. Maggots are also dressed similarly.

The maggots are caused by the natural habit of the large blow-fly—*sarcophaga carnaria*. This fly deposits its eggs in such places that will ensure warmth, and those selected are spots where putrescent matters accumulate—as putrid flesh and sores of men and animals, and in the fleeces of sheep.

Wool is largely covered by a natural unctuous secretion, thrown out from the body for the purpose of its preservation as well as that of the wool itself, and that secretion—called the yelk—is liable to undergo decomposition or putrefaction beneath the effects of a hot summer. Hence the prevalence of maggots in sheep in summer instead of winter. A warm moist atmosphere is highly favourable for their development, as in the case of all insects or animalculæ whose genesis depends upon putrefaction. Sheep are very commonly affected with maggots about the head and tail when a large wound is found, in which the eggs are deposited. In a short time, these being hatched, the *pupæ* or worms appear in almost countless numbers, crawling about exactly as mites do in cheese when epicures pronounce it only fit to eat. The preference that flies have for the head and tail of sheep is a matter of very simple nature. When sheep butt each other wounds are caused, and into these are the eggs deposited. When they appear about the tail, the dirt and filth which has accumulated in consequence of diarrhœa is the cause of attraction; and if any other part of the body is affected, the length of wool and its profuse secretion—or it may be a wound—has induced the fly to deposit its eggs there.—*Ed.*]

SHEEP DIPPING AND SMEARING, AND THE RESULTS OF USING POISONOUS PREPARATIONS.

[The relative advantages of dipping and smearing sheep and lambs is a question of profitable discussion for all flock-masters. Circumstances somewhat modify the conditions under which each are to be adopted; but we are afraid they receive too little consideration at the hands of the proper persons.

The nature of the various preparations has in a great measure influenced their use, particularly as to mode and season, and by this the prevalence of parasites has been extended, growth

of wool and improvement of condition likewise retarded. Ointments have been used during certain seasons as preferable to dips, the former when applied having a well-known greater influence upon the diseased parts than metallic solutions. But decided objections to their use are many—not the least of which is the impossibility to reach every part of the body where parasites are present. Dips containing metallic poisons are also objectionable, as in cold weather the animal requires more than ordinary attention. With such a weight of fleece, and its capacity for holding fluid, sheep are not advantageously dipped in winter-time. In this way ticks and lice are propagated, and wool damaged greatly; and when the ewes are shorn in warm weather, the lambs are attacked by the parasites that crawl upon them in search of the warmth of the fleece. The practice of dipping lambs also at this time is not sufficiently carried out. The process is far more likely to effect the good required if sheep were dipped at least twice a year in the fleece, and lambs always as soon as the ewes are shorn; and this may be readily accomplished by patronizing the non-poisonous kinds of preparations. Ointments of mercury and arsenic, tobacco-juice, and dips of various metallic preparations, with oil of tar, creasote, &c.—whose names and variety are as numerous almost as sheep themselves—are used too indiscriminately, and it is astounding how many deaths occur. A few years ago 850 sheep were poisoned by the use of an arsenical dip, while the men who engaged in the operation suffered also very considerably. In the Isle of Man, two years since, similar losses took place from the use of mercurial ointment. About the same time, in Warwickshire, a great number died from a concoction of tobacco-juice and corrosive sublimate; and in an adjoining district a great loss occurred from the use of a compound of tobacco and oil of tar.

Two causes for such wholesale destruction are recognized. When poisonous fluid dips are used, in which the animals are

immersed, and sufficient care in draining the wool is not exercised nor the animals properly confined, the poison becomes mixed with food, more particularly the grass on which they are probably turned afterwards. It is thus taken inwardly, and death results. The second cause is to be found in the use of ointments or oily preparations—as in “salving” and “pouring”—and is referable to the power of absorption from the skin. As a rule, watery solutions of metallic agents have probably the *least* effect upon the skin: not being properly absorbed, they require to be strong in order to penetrate, and kill the parasite and destroy the eggs, but when the skin is abraded they prove very dangerous. Tobacco-juice readily affects the system, and with ointments probably is the most efficacious, but at the same time most deadly.

Another objection to the more extensive employment of dips has arisen from the fact that ewes in lamb suffer, and either abortion or difficult parturition ensues from the handling.

Sheep are generally dressed by absolute immersion into a bath, to accomplish which they are turned upside down, which entails some amount of rough handling; and it is to avoid the consequences of this that a bath is not used. They are usually “poured” instead—an operation which consists of parting the wool along the centre of the back from the head to the tail, and pouring on the mixture, which is worked into the wool as the animal stands. This process requires double the quantity of material, is more tedious, and not so effective as dipping. In order to obviate these difficulties, Mr. Dickinson, of Boston, recommends and uses a warm bath in the first place, which has a more powerful effect on the parasites, and by means of a lever raises the animal—whether it is a lamb, hog, or ewe—carefully, and deposits it gently, feet downwards, in the bath. In this way the serious consequences just alluded to are entirely done away with.

We have great pleasure also in stating that Mr. Thomas

Fardon, of the Linslade Iron Works, Leighton Buzzard, has given some attention to this subject, and has succeeded with the writer in arranging a simple yet portable bath and apparatus, by which sheep may be easily dipped without turning them upon their backs. By a very easy method the animal is safely and rapidly raised and dropped into the bath ; after the prescribed time has elapsed, it is again as easily raised, when the arrangement admits of the sheep walking first into a compartment where the fleece is sufficiently drained; and afterwards to the ground. Such a combination of advantages will enable the farmer to treat the contagious parasitic skin diseases of sheep and other animals—more particularly the former—with efficiency and economy, *at any season of the year, and under every condition of the animal.*

This is a step in the right direction, and the end must be that the growth of mutton and wool will be considerably enhanced by improvements that will assuredly take place, both in the preparations and means of using them, as well as the process of dipping being established as an indispensable item in the regular and periodical operations of every well-managed farm where sheep are present.

Of late years great advances have been made in the question of dealing with the dressing of sheep. It has been taken up more extensively by veterinarians, and much good has resulted. Arsenical dips and mercurial smears, and tobacco-juice dressings are found to be the most deadly enemies of the flockmaster. If the metallic poison does not kill the sheep, the caustic alkali with which it is associated destroys the wool, and the tobacco-juice or tar preparations permanently discolour it. *Non-poisonous* dips are deservedly gaining more favour, and, without doubt, the preparation manufactured by J. G. Dickinson, of Boston, Lincolnshire, has proved itself eminently all that is required. Two or three years ago we purposely subjected this celebrated "Lincolnshire Oleine and

Glycerine Dip" to some severe and scarching trials, and in all the results were perfectly satisfactory. Its properties, as far as we summarized them, appear to be as follow: The fleece is thoroughly cleansed, and rendered beautifully white by immersion during one minute. The natural yelk of the wool is retained, while the fleece is rendered soft and silky, and capable of resisting rain and moisture. The wool is impregnated with a powerful disinfectant that prevents the attack of the fly, and, consequently, the presence of maggots. The growth of wool is considerably increased, and all parasites are destroyed. It was also found that sheep might swallow the solution in which they were dipped, yet suffer no harm, besides being a most valuable disinfectant for buildings, clothing, &c., after disease of a contagious character has been present.

With regard to scab, it must be observed that one dressing by any preparation is not sufficient. Such a formidable disease requires great perseverance; two or three dressings are sometimes necessary, and the incrustation should be well brushed up at each operation. From the results of these experiments, therefore, we have no hesitation in recommending the "Oleine and Glycerine Dip" to the notice of flockmasters who desire to secure the greatest amount of good at the least possible cost, and with the most perfect safety to animal life. For further particulars the reader is referred to the announcement issued by the proprietor.

There are many points that require grave consideration in the treatment of sheep in order to destroy the parasites infesting their fleeces. Thousands of pounds have been squandered in the manufacture of compounds which were thought to supply all the necessary wants, but on trial proved only so many abortive attempts. Experiments have been carried out *too practically*. To kill the parasites was an exclusive question; but time showed that the life of the sheep and value of

wool held an important place, and required as much consideration as the parasites. Remedies to kill parasites are not difficult to find; but those that perform that part of the process often too faithfully destroy the sheep also. Others, again, but imperfectly kill the parasites, and in a few weeks the sheep are tormented as badly as ever; while some are intended only to sell, as the Yorkshireman's razors—not to use efficaciously. Another remedy professes not to be injurious to the sheep, when at the same time the vendor knows he is not honest to the public, as his compound is made up of the most villanous trash and absolute poison that can be concocted. Not only do the sheep suffer in body, but also the wool is affected. Its fibre is destroyed, it becomes brittle, and breaks off short, and the men who have dipped the animals suffer from excoriated arms, bodies, and thighs to no little extent. In some compounds we find that a great amount of colouring matter exists, by which the wool is permanently stained, and consequently damaged. It can only be used for the manufacture of dark-coloured and inferior goods, and therefore realizes but a poor price in the market.

Again, some remedies abstract the yelk from the fleece and deprive it of the power of throwing off rain and moisture. The sheep is cold and starved. The animal is unthrifty and predisposed to disease, and mortality is therefore indirectly produced. If the nature of the parasites had been studied contemporaneous with the properties of the fleece and action of remedies, much valuable time and money would have been saved. It is another instance of the "practical" character of Englishmen and their disregard for philosophical study. Upon the Continent, when questions of a chemical character are before men of enterprise and speculation, experiments are assiduously carried out in the laboratory, and by means of the smallest quantity of material, in simple retorts, beakers, and test-tubes. If a medical question requires solution, animals

are ungrudgingly submitted for test, and other appliances are as readily brought forward. But, in "practical" England, a man goes to work with vats and furnaces at once. Buildings are thrown up in which to execute wonderful processes; the laboratory is set aside for more stupendous evidences of practical earnestness, and he at last usually finds, to his cost, the truth might have been learned from a few tubes, wine-glasses, old pickle-bottles, and other extemporaneous chemical appliances. The idea of being practical has swamped many men, and will continue to do so as long as philosophical study is neglected. With our earnestness, energy, and invincible perseverance as a nation, and the philosophical turn of France and Germany united, the agriculture and commerce of Britain would assume gigantic dimensions, and greater independence against foreign resources. But we prefer to work and think practically, and enjoy it. Some day we may think and work differently.

REMEDIES EMPLOYED IN DIPPING OR DRESSING SHEEP AND OTHER ANIMALS INFESTED BY PARASITES IN THE SKIN.

The attention of scientific men has not been directed sufficiently to the destruction of parasites causing skin diseases among the lower animals, particularly sheep; and, excepting the recommendations to use the pernicious preparations of arsenic, corrosive sublimate, &c., &c., it may be said nothing of consequence has been done.

The cost of remedies militates greatly against the adoption of many that might prove serviceable, and even the difference of only a few pence between an unsafe arsenical or mercurial preparation and a safe non-poisonous dip, is too frequently held as a reason for using the former. We have known farmers use such poisonous preparations—paying at the rate of six shillings per hundred sheep—to the great detriment of the

wool, pounds being wasted at clipping-time ; when their neighbours, using the non-poisonous dips, which has cost ten shillings per hundred sheep, have sold their clip for quite as much more as was lost in the other case. Seeing this indisposition to patronize efficient and safe remedies, the attention of scientific men has been diverted into other channels.

These statements are not intended to convey the idea that nothing has been tried or done. We are well aware of remedies that may be concocted into suitable preparations, but their original expense precludes their introduction when farmers are so prejudiced against cost, and prefer to kill their sheep rather than keep them safely. The whole pharmacopœia has been ransacked, but this great difficulty continues to stare experimenters in the face.

Among the most active principles yet found is creosote : when pure it destroys the life of the parasites rapidly, but it also kills the sheep. This fact has led to the mixing of various fluids having an active principle, such as creosote, naphtha, petroleum oils, various acids, infusions of certain vegetable productions, as tobacco, digitalis, &c. ; but in all some great objection exists. The most active preparation, killing the sheep, does not always produce such violent effects upon the parasites. For instance, the worms found in the windpipe of lambs and calves will remain in strong solutions of corrosive sublimate, turpentine, &c., &c., for some time, and afterwards exhibit the conditions of life. Likewise arsenical preparations, notwithstanding all that can be asserted by means of an extensive circulation of handbills, illustrated show-cards, and the employment of machinery, with the rest of the usual twaddle that goes with advertising generally, fail to destroy the parasites effectually or prevent the attack of the fly ; but with the acknowledged effects of such remedies is frequently observed greater destruction among the higher animal.

Notwithstanding the existence of an Act of Parliament

which came into operation in 1848—and specially refers to scab among sheep, in common with other contagious affections—it appears to have slumbered in obscurity and has seldom or never been enforced. The reason of this is very obvious. In accordance with rules which prevail much at head-quarters—that provide offices for men instead of men for offices—district inspectors have been selected from the most incongruous classes. Tailors, shoemakers, bakers, grocers, ex-policemen, dilapidated tradesmen of all branches, sheriff-officers, tax-collectors, *et hoc genus omne*, have swelled the lists and strutted about our markets with all the presumption possible, and to the annoyance of many well-disposed and honest farmers. At that time, and at this day, veterinary science occupies no suitable position in the affections of Government, and, like its contemporary, agriculture, has been left to make its advancement as best it could. No institutions have been formed, no schools endowed. Its teachings have been disregarded; and when its professors could have been of the greatest service—when inspectors were first appointed, many of whom exist in office now—they were not solicited, and many of the class named were appointed instead. How the parties at the head of affairs could suppose that a judge of bacon, leather, and fabrics for wearing apparel must inevitably be also a judge of the signs and nature of disease among animals is altogether marvellous. Such a conclusion must be the result of some peculiar reasoning quite unknown to us, and special to the members of the deservedly-named “Circumlocution Office.” Such men have not been able to detect disease among cattle and sheep. They are as likely to condemn a sound animal as an unsound one, and frequently have committed such mistakes. It is only recently that one of this class of *savans* condemned a pig as having the small-pox—a contagious disease of sheep and human beings, *but never in Britain seen in pigs*, nor even present among sheep in isolated instances, but always prevailing extensively after intro-

duction, requiring very active means for its suppression. Bad carcasses are as likely to pass such men as the very best. They generally proceed to action either in sheer ignorance and determined to do something by way of example, or "in consequence of information received." If one butcher has a petty spite against a neighbouring opponent in the trade, he easily carries it out by reporting that so-and-so has sent so much diseased meat to market ; and almost certain, the meat—although good—will be condemned. Such a case occurred a few months ago in Lincolnshire.

In consequence, therefore, of disease being but imperfectly made out, or not detected at all, the Act has been literally of no service. But supplemented by action roused by the appearance of the Cattle Plague, the machinery has been extended and greater powers have been conferred ; and now woe betide the man who knowingly introduces contagious disease of any kind in cattle to others in an open market where a proper veterinary inspector has been appointed.

Such apathy on the part of Government had prejudicial effects otherwise. There was no desire abroad to limit the spread of scab by proper means. Remedies which were born of tradition only, and used from time immemorial, were resorted to. Sheep were carelessly dressed and sent to market ; some were sold and many died, and yet little or no attention was directed to the fact. As in all such instances, the farmer bore the loss and murmured quietly, believing such to be one of the inevitable conditions of agricultural leases, and opinions of all sorts were freely given as to the nature of the disease. Rarely has such wholesale losses been looked into. Real efficacy has been sought in medicine, and "drinks" have been concocted by the thousand, yet no mitigation of the mortality occurred. Sheep died by tens, and even hundreds ; their carcasses were buried without examination ; speculation served to account for the conditions ; and thus no progress was made.

Farmers should be made aware that no such enormous losses can possibly occur without mismanagement—there must be a cause for all this; and they should also know that nothing would be more profitable to study in order to avert the disastrous consequences.

The secret lies in the existence and propagation of scab. Proprietors finding their flocks affected, fly to their old remedies, and mercurial ointment is obtained, or solutions of arsenic or mercury are used as dips; and to their use—especially the former—is due much of the mortality which of late years has been witnessed. These have already had a passing notice, and we propose at present to go more fully into them. They operate upon the animal body in several ways, and the action of the principal ingredients is materially affected by certain conditions which we shall attempt to describe.

In the first place, the injurious effects of sheep dressings are due to the power which is present in the skin to absorb materials from its surface, and pass them onwards through the circulation to all parts of the body. This, as will be already apparent, is often greatly aggravated when circumstances have called for repeated dressings. Mercurial preparations, and those also containing arsenic—particularly when put up in the form of an ointment—are very powerful. The absorption is also more rapidly effected, and by this means is the more poisonous. All parts of the flesh become impregnated with metallic poison, and exerts its baneful effects upon all who partake of it under those conditions. In addition also, we observe that all ruminants—particularly sheep—are more easily poisoned than any other creature by mercurial dressings.

The loss of condition is not an inevitable occurrence after mercurial dressings. Animals may continue in apparent health for some time subsequently, but become weak, easily affected by change of temperature or any morbid influence, and therefore predisposed to other diseases. It is thus that many die

from what may be viewed as pleuro-pneumonia, while others suffer from colds and severe indigestion. If parasitic disease of the lungs—worms in the windpipe—has affected the animal, the results are rendered much more rapid and fatal than if mercurial ointment had not been applied ; and, in fact, if any disease be present—even in its most simple and incipient form—it is hastened towards its crisis and to fatal terminations.

But apart from general emaciation which is produced, and predisposition to disease, the absorption of mercury into the system produces disease of a special character, known as “mercurial poisoning,” “salivation,” &c. As in many other cases of disease among sheep, the early symptoms are either altogether unnoticed or but imperfectly recognized by those in attendance, and much time and money are lost in consequence. The usual signs of mercurial poisoning are somewhat as follow : The animals pant, are very weak, nostrils dilated, and appetite capricious or absent ; sometimes there is soreness of the mouth, profuse salivation, and marked difficulty in collecting the food ; in other cases the animals totter and shiver extremely, which is a most important and dangerous symptom. The pulse is rapid, small, and feeble, and eventually becomes indistinct or imperceptible ; the eyes are blood-shot, and the animals die discharging a frothy mucous from their nostrils in large quantities.

After death the lungs are found to be filled with dark blood, and that in the heart and blood-vessels is also black and fluid. The windpipe and its branches (bronchial tubes) are filled with froth and mucous. General signs of impoverishment are present in many organs which to the cursory observer would be taken for those of health.

The second effect produced by sheep-salve is witnessed at a more remote time. Some animals are reduced considerably in condition, and for a time suffer a loss of—or at least a very defective—appetite. During this time the poison is being

thrown off from the body, and at length the sheep recovers its appetite, when, if good food is allowed, it becomes the victim of blood disease of a most virulent form, which we have noticed (page 96). In this way the death of animals is not usually associated with any previous dressing with salve. The time has passed long ago, and deficient knowledge of disease prevents any one recognizing signs which specially belong to such conditions.

The third effect is principally of a mechanical nature. The principal use of the wool is to provide warmth to the delicate sheep; it is a non-conductor of heat and prevents rapid radiation from the surface, while it also acts as a means of promoting the natural exhalations from the skin, and with them the impurities of the blood.

In its natural condition wool is soft, light, and open, the yelk, or natural secretion, tending to preserve those conditions; but after salving, the wool is matted and knotted together in hard lumps. The fleece becomes a non-porous or impervious coating, and resembles a mackintosh or India-rubber garment. The perspiration cannot go off, the blood does not lose its impurities, they accumulate, and at length a condition of blood poisoning is produced, from which the animal seldom or never recovers. In this way also lambs are frequently killed. It is a common practice among shepherds, when a ewe loses its lamb, to take off the skin and place it upon another which is intended for her to bring up. That skin becomes a coat like the wool matted by salve—like an India-rubber coat—and produces death exactly in the same way—blood poisoning.

Experiments may be taken to prove these facts, and Majendie, Fourcault, and other physiologists have demonstrated by them the danger of interfering with the action of the skin. They covered dogs with a coating of varnish, others were encased in a coating of mackintosh, and in all cases, if not

removed, in a few days the whole train of symptoms by which blood poisoning is denoted regularly appeared.

These results are entirely due to the accumulation of carbonic acid in the blood, together with ammonia and other products of the action called metamorphosis of tissue or waste of the body, and symptoms of suffocation are not uncommonly present in addition to those already given.

In dry weather the effects are frequently augmented considerably. The salve in the fleece serves as a means of attracting dust and dirt, the wool is thereby hardened and matted more firmly together, and at once becomes a most powerful obstacle to the natural exhalations of the skin.

The *Treatment* of such animals consists in washing out the salve as quickly as possible after the symptoms are observed, or the fleece should be clipped off. Put the apparently healthy ones upon a bare pasture, and give the actually diseased ones good shelter in the farm-yard. Avoid blood-letting, and if any medicines are prescribed by the medical attendant, great care must be observed in the administration, as the sheep may be very easily choked by the fluids passing down the windpipe.—*Ed.*]

RINGWORM IN CATTLE.

[We have chosen to head this article with the above title, rather than incur the risk of confusion by adopting the term "herpes," as is commonly done. *Herpes circinatus* is applied by Erasmus Wilson to the form of vesicular ringworm noticed under "Skin Diseases," but it might with greater propriety be extended to this. It is, however, distinguished by the terms *porrigo* (from *porrum*, a leek; and *igo*, to act); also *favus* (from *foveo*, I cherish), on account of the circular scab, and its resemblance to a honeycomb; and *fivca* (I continue), from

the tendency to prevail. Professor Gamgee suggests the more correct term, *herpes tonsurans*.

This form of herpes is distinguished from every other by special characters. Professor Gerlach, of the Veterinary School of Berlin, gives the following description.

(The professor has devoted much attention to the so-called herpetic eruptions in cattle, and concludes they are the product of a peculiar vegetable parasite. Such eruptions occur chiefly about the head and neck in prominent circular plates, having a squamous or scaly appearance of a grey colour, about the size of a crown piece, and accompanied by violent pruritus (prurigo) or itching.)

“ The squamous crust is about two or three lines in height, and has a greyish-white, fibrous appearance. At first the crusts are very firmly adherent to the skin, and if detached from it leave a bleeding surface; they afterwards become less so, and ultimately fall, leaving patches of hair.

“ The eruption commences by little circumscribed points about the size of a pea, which increase peripherally [or outwardly], and thus gradually form the scaly crusts, which generally fall off from six to twelve weeks after the first appearance. On examining the crusts with the microscope, long chains of quadrangular sporules are observed. There was also a large number of round isolated cells.

“ The parasite (*trichophytes tonsurans*) is formed in the hair follicles. In well-developed crusts a layer of sporules surround each hair, while in less perfect ones some hairs are quite free from them.

“ M. Gerlach having remarked that oxen which were in the same stable with those affected contracted the disease, determined to perform some experiments, with a view to ascertain whether it was communicable to other animals.

“ The crusts were divided coarsely, and placed under the hair of several oxen and calves. In all these animals the characteristic skin affection developed itself. When fragments of the crusts were placed on parts quite denuded of hair, no eruption manifested itself.”

Further experiments proved the disease is communicable to the horse, but failed in sheep and pigs, and succeeded in oxen even after the expiration of two, three, and six months. In man the disease resembling *herpes circinatus* was produced, in

the crusts of which was contained the vegetable parasite that produced it in the ox—*trichophytes tonsurans*.

The parts affected are those covered or partially covered with hair, inasmuch as the structures involved is the follicle or bed of the hair itself; therefore parts not possessing hair are not affected, and hence the cause of the disease being located

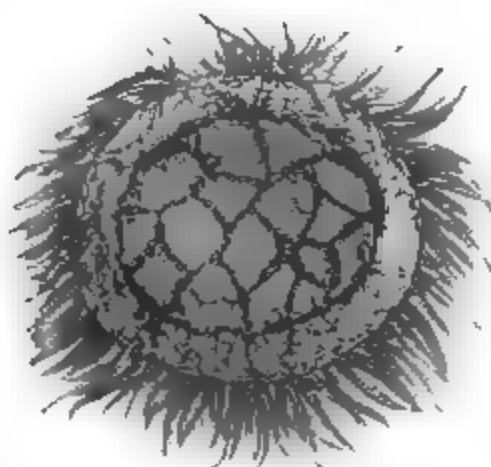


FIG. 193.—*True Ringworm (Herpes Tonsurans)*.

in the head and neck, and more rarely upon the arms, of the attendants upon animals that are diseased. Cattle suffer about the head, forehead, eyelids, and face, in consequence of their congregating with each other, and exhibit patches of an irregularly circular form, having broken or stumpy hairs, scales, and imperfectly-formed scabs. In extensive forms of the disease the constitution exhibits signs of disturbance.

Treatment.—Segregation of all diseased animals. Clean the parts carefully with soap and water, and apply oxide of zinc ointment, solutions of nitrate of silver, chloride of zinc, sulphate of zinc, perchloride of iron, &c., &c.—*Ed.*]

WARBLES OR WOURNLS IN CATTLE.

[During the warm summer months cattle of all ages may be seen furiously galloping about the pasture with tail uplifted, and evidently in a state of great excitement. After a time they

stop, look round anxiously, and evidently regard the sound of passing insects with a great deal of suspicion; and, without any other warning, utter a short wail, and start off as before. This is occasioned by the *æstrus bovis*, which attacks the animal, pierces the skin, and deposits its egg in the orifice. In a short time a small swelling is observed, which grows larger by the deposition of lymph and development of the larva from the egg, and in time is discharged by the process of suppuration, almost ready to propagate its species. It may fall upon the ground or elsewhere; and when the temperature around is sufficient to hasten the further development, it assumes wings, and shortly commences to deposit its eggs in the manner described. Cattle turned into pastures may be observed to suffer from large tumours, having small open orifices, discharging pus immediately before the larvæ are ready for dismissal. Such tumours acquire the size of a walnut in many instances; and when there are a great number, we have seen moderate-sized calves standing alone, feverish, and evidently suffering from pain in consequence. Usually they do not call for treatment, but in the instances alluded to relief only succeeded removal of the larvæ, and dressing the wounds by astringent lotions. Simple pressure by the fingers succeeds in dislodging the larvæ very readily.—*Ed.*]

WORMS IN THE INTESTINES.

[All animals suffer more or less from the presence and accumulation of worms in the intestines. A common belief is that when they become poor, and from any cause suffer a loss of condition, "the body breeds worms;" as a result, however, of observation, we are inclined to regard the loss of condition and other signs which are developed during the existence of these parasites, as a direct result or effect, and not the cause.

Among cows the tapeworm is found, and besides, a large

round worm, called the *lumbrices* or *lumbricoides*; in calves, pigs, and sheep, small thread-like worms accumulate in countless numbers, consisting of two varieties—*strongyli* and *ascarides*; and lambs suffer fatally from the tapeworm in addition.

The prevailing signs of worms being present are irregular or ravenous appetite, hidebound appearance, more or less inactivity, loss of condition and bloom of health, with general weakness and lassitude. Sometimes diarrhoea is present after the action of the bowels has been irregular, and, in addition, colicky pains produce much distress. Further evidence of their presence is the fact of their being found among the excrement. Death arises from a combination of causes, which minister to the production of general weakness by an interruption of the digestive and assimilative powers.

Treatment.—In the hands of the farmer or amateur nothing answers so well for the destruction of worms in the intestines of the animals in question as the oil of turpentine given in thick linseed-tea, mucilage, flour, gruel, or linseed oil. Such a preparation as the following is in common use :

●
RECIPE NO. 164.

Take of linseed oil	1 pt.
Oil of turpentine	2 oz.
Infusion of quassia	$\frac{1}{2}$ pt.

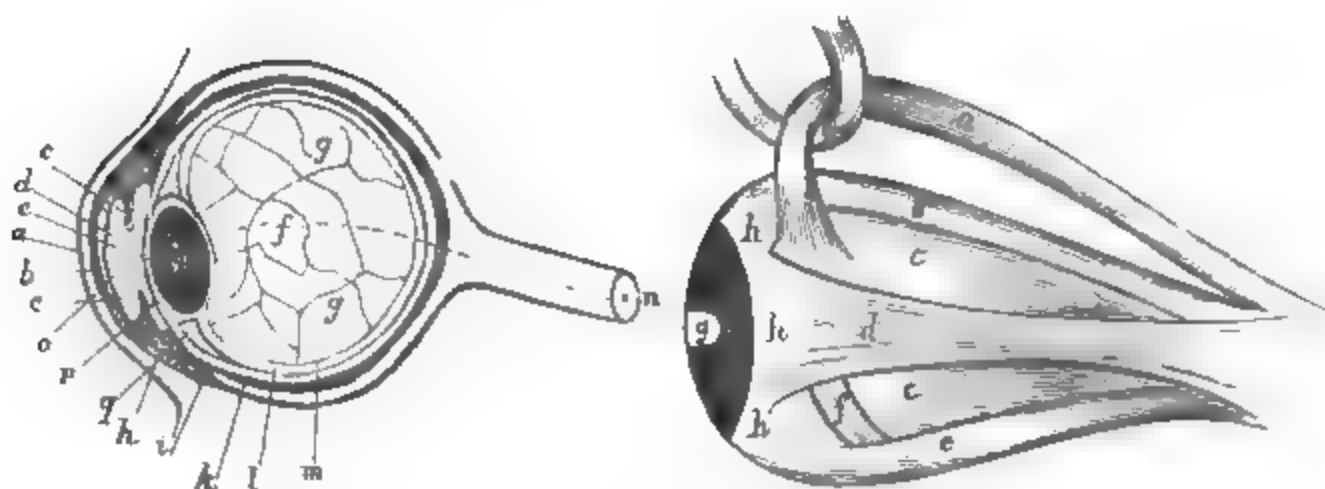
Mix, and administer before the morning meal. Smaller animals may receive one-fourth, one-sixth, or one-eighth, in proportion to their size. One-year-old stirks will require half the draught; calves of six months and upwards, one-third. The dose may be repeated in a week or ten days. Common salt should be given for a few days in the food, and alternating with it a few doses of sulphate of iron (see Appendix) during also a few days. (See “Enemas” in Appendix).

Other remedies—as croton, iron filings, &c.—are used; but we would advise every proprietor to avoid proceeding beyond what has already been given. In many instances they are

sufficient, and, if given as directed, safe. When an incongruous number of recipes are tried, danger often results. If what we have recommended should fail, the safest and wisest course is to consult a reliable practitioner, who, after being made acquainted with the nature and details of the case, is best capable of giving the most suitable aid and advice.—*Ed.*]

SECTION XI.
DISEASES OF THE ORGANS OF
VISION,
AND THEIR APPENDAGES.

DISEASES OF THE ORGANS OF VISION, AND THEIR APPENDAGES.



FIGS. 194 AND 195.—*Sections of the Eyeball.*

- | | | |
|---|--|---|
| <p>a. Conjunctiva or outer Membrane.
b. Cornea.
c. Iris.
d. The opening called the Pupil.
e. Crystalline Lens.
f. Central Artery.
g. Vitreous Humour.
h. Ciliary Muscle, the agent which regulates or adjusts the Eye in vision.
i. Sclerotic or outer coat.
k. Choroid or Vascular coat.</p> | <p>l. The Retina—Nervous Membrane—an expansion of the Optic Nerve, on the soundness of which sight depends.
m. Hyaloid Membrane investing the Vitreous Humour.
n. Optic Nerve, communicating with Brain.
o. Anterior Chamber.
p. Posterior do.
q. Canal of Petit, or space surrounding the Crystalline Lens.</p> | <p>a. Superior Oblique Muscle.
b. Do. Straight do.
c. Retractor Muscle, which draws the Eyeball backwards.
d. External Straight Muscle.
e. Inferior do. do.
f. Do. Oblique do.
g. Cornea, showing the Iris and Pupillary opening.
h. The Sclerotic or outer coat.</p> |
|---|--|---|

OPHTHALMIA.

[Cattle and sheep, and occasionally pigs—but more particularly the two first—are liable to this disease in its various forms at different seasons, when it appears as a sporadic affection, or under more trying conditions as an epizootic.

By the term *ophthalmia* is understood inflammation of the eye; but, in order to recognize the disease as located in one particular part of the organ, we make use of special terms, as

578 *Diseases of the Organs of Vision.*

corneitis—inflammation of the cornea ; *retinitis*—inflammation of the retina ; *iritis*—inflammation of the iris. These various structures will be best understood by a reference to the annexed diagrams (Figs. 194 and 195). Although by making this anatomical distinction and recognizing special functions in each part, we can trace the existence of disease confined to one of them, it is not uncommonly found that, after several or repeated attacks, total blindness results from the whole of the structures being involved in the first known seizure. We shall, however, briefly describe the different forms as they appear and are known to merge into each other.

Corneitis—Superficial Ophthalmia—Conjunctivitis—Inflammation of the Cornea—Inflammation of the Conjunctiva.—The cornea is the external prominent convex portion of the eyeball, through which vision is partly performed as a part of the optical apparatus. Externally it is covered by a delicate membrane—the *conjunctiva*—a reflection of that which lines the eyelids, and elaborated form of the skin itself. In superficial ophthalmia, then, we have inflammation of these structures : hence the terms—*corneitis* and *conjunctivitis*. Their approximation will scarcely admit of any freedom from participation in the general morbid action : when one inflames the other is affected also, as the conjunctiva acts as one of the means of nutrition by its blood-vessels to the cornea beneath it.

Symptoms.—Constitutional disturbance always accompanies derangement of the organs of vision, but varies in intensity with the amount of inflammation present. The pulse is accelerated, being tolerably full and hard, the mouth is hot, and the appetite and rumination frequently affected, if not arrested entirely. The animal stands away from his or her companions, evidently suffering from pain, while the nearly closed but frequently twitching eyelids drop abundant tears. If the organ is touched, or hands laid upon the animal, he starts away at a bound, and evinces every desire and attempt to avoid an exa-

mination. The eye must be exposed, which is done by placing the finger and thumb respectively upon the edges of the upper and lower lids, and separating them, when the cornea is found to be opaque and of a bluish grey colour, from the infiltration of the products of inflammation among the layers of cells which enter into its composition. The conjunctiva lining the eyelids is deeply inflamed, as indicated by an increase of temperature and deep red colour.

In *retinitis* the same signs are observed, with the exception of the superficial inflammation being less, and cornea nearly transparent. The margin of the pupillary opening is thickened, and the colour of the iris, as contrasted with that of the other eye, is strangely altered. It may be of a reddish yellow, or muddy and opaque. The aqueous humour becomes hazy, and motions of the iris are interfered with or totally suspended. Such conditions increase, and by extension the cornea is included, and it may be the deeper seated structures also, terminating in blindness.

Retinitis or Specific Ophthalmia.—This is not so common as a distinct affection in other animals as in the horse. Its occurrence may be assigned as a complication of the preceding states, although in many instances the gradations are rapid or unnoticed.

The deeper seated structures are implicated in this form of ophthalmia. The retina—a membrane that lines the interior of the eyeball, and whose healthy condition is essential to the function of vision—is a *locale* of the disease, together and mainly with the vascular membranes lying immediately beyond. The pupil is at first contracted; the eye is incapable of bearing the stimulus of light; profuse lachrymation or discharge of tears takes place; and constitutional disturbance is greater than in the simple form (Fig. 196). The eyelids are closed, and the animal seeks quietude and freedom from the light. If the eye is examined, pain appears very great: as soon as any

attempt is made to separate the lids, tears gush out, the *mem-*



FIG. 196.—*Ophthalmia.*

brana nictitans, or haw, instantly protrudes, and covers the eyeball, and exhibits the usual participation in the inflammatory action. When the interior of the eye can be seen, it will appear to possess a tinge of redness, and more or less haziness, or even opacity of the vitreous humour, is present.

Sometimes a yellow appearance presents itself at the bottom of the eye, which is the result of inflammatory action. The discharge from the angles becomes thicker and even purulent, light is borne more easily, and other signs gradually subside with a return of vision. But this may be only transient, for in a few weeks the symptoms denote another attack equally intense as the first, the retina is destroyed, and the products of inflammation are deposited throughout the eye, which assumes a pearly whiteness (cataract), and vision is altogether lost.

Causes.—We have said these results are frequently observed as the effects of simple ophthalmia. That disease may occur at various times, and by extension produce all the effects we have described; yet there are instances in which specific ophthalmia appears, in the absence of direct facts to the contrary, to take on the hereditary form, as in horses. More generally, however, it appears as a result of some exciting cause, as exposure, frequent attacks of simple ophthalmia, as already alluded to, blows, &c., &c. The conjunctival or simple form usually arises from exposure to cold winds in bleak situations, &c., and the insinuation of foreign bodies, as hay-seeds, the husk of oats, wheat, &c., &c.

In certain seasons a severe form of general or specific ophthalmia takes place in the cattle or sheep—and it may be

in both—of a whole district. In 1868, during the prevalence of an Indian temperature, for which that summer was remarkable, we saw flocks of sheep and lambs that were blind in consequence of being seized with this disease. The excessive sunlight as well as heat, conjointly with scarcity of grass, from which the animals were compelled to exert themselves continually, were the undoubted causes. Had there been an abundance of keep, the consequences might have been mitigated, as part of the time occupied in rumination would have afforded some relief. But the ground was bare, and radiation more complete from the want of an absorbing agent as vegetation. The causes were thus extreme, and more than such a delicate membrane as the retina is could bear without suffering structural change. Cattle also in certain districts were affected in a similar manner. Such are, however, uncommon causes, as the seasons like that of which we have spoken are rare in Britain. More commonly in the spring or autumn when cold winds prevail, or in those seasons characterized by humidity, cold, and dulness, and others when a north-east wind is accompanied by an extreme hot sun at mid-day, ophthalmia is very general. A rapid ride by railway during such weather, particularly after close confinement, is also a fertile cause.

Treatment.—Removal of foreign bodies from the eye is all-important. The means required are various and in accordance with circumstances. Sometimes the corner of a silk handkerchief will answer when the offending agent is loose, small, and near the eyelids; but it may happen that a husk or flyer of oats or wheat has been present a day or two, and by effusion from the surface of the cornea has become firmly attached. Then a pair of forceps must be used, as shown in Fig. 197. For this purpose the bulldogs will be needed, and it may be necessary also to seize the *membrana nictitans*, or haw, by means of a needle and thread or tenaculum, as the power exerted by the retractor muscle, which draws the eye-

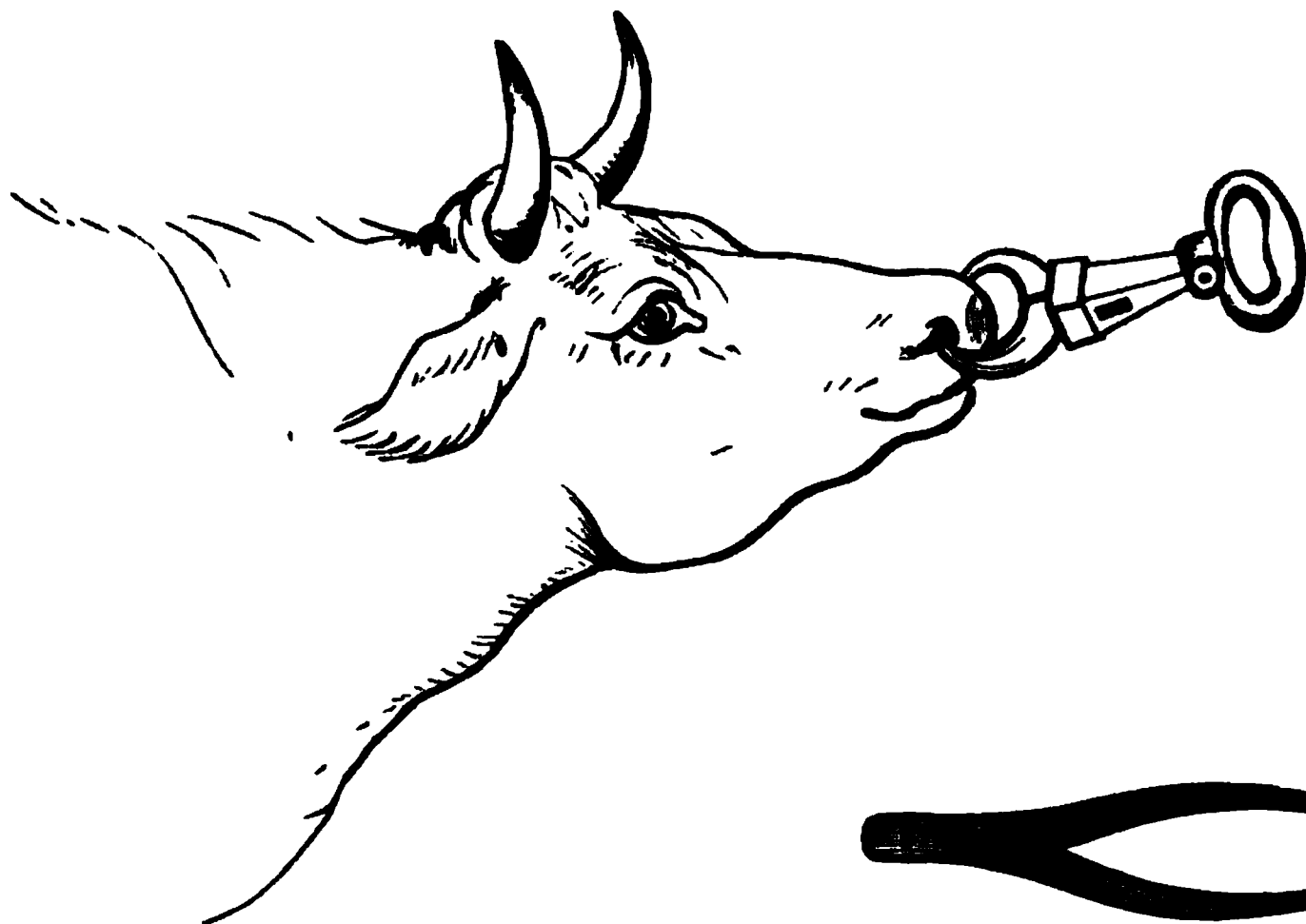


FIG. 198.—*The Bulldogs as they are applied to the Nose.*

FIG. 197.—*Forceps for seizing foreign bodies in the Eye.*

ball backwards and so pushes the haw forwards, is so great in the ox as to defy almost any means to make a satisfactory examination of the organ. (See Fig. 201, page 586.)

The next proceeding is to administer a laxative, such as the following :

RECIPE NO. 165.

Take of Epsom salts	12 oz.
Calomel	$\frac{1}{2}$ dr.
Gentian and ginger, of each	1 oz.

Mix, and give to cows, &c., of two years old, increasing the salts to one pound or twenty ounces according to size. Stirks one year and upwards will require three-fourths.

RECIPE NO. 166.

Take of Epsom salts	6 oz.
Calomel	10 grs.
Ginger and gentian, of each	4 drs.

Mix. The full dose to be given to a calf of one or two months ; three-fourths to a sheep, and one-half or quarter to a lamb, according to size.

Each drink to be given in warm ale or gruel, with treacle.

The eye may be dressed repeatedly with either of the following lotions :

RECIPE NO. 167.

Take of acetate of ammonia	6 oz.
Spirits of wine	2 „
Water	1 pt.

Mix ; or,

RECIPE NO. 168.

Take of tincture of opium	4 oz.
Water	1 qt.

Mix.

Much depends upon a constant application of the lotions, and a most advantageous proceeding is to attach to the horns or by other means a cloth or linen rag, which shall cover the eye, and, by being repeatedly saturated, will keep up a constant evaporation, as well as sedative effect. The animal should also be removed from excessive light, and, if possible, to a well-ventilated, clean, but darkened building.

Subsequent treatment consists of daily doses of sedative medicine, as the acetate of ammonia, aconite, the neutral salts, &c., &c. (see Appendix), until the pulse exhibits evidences of being under their influence and the inflammation is subdued, when the animal may be gradually restored to his usual light and liberty.

Opacity of the cornea (*albugo*) must be treated by applications of nitrate of silver, iodide of potassium, &c. (see Appendix), daily by means of a camel's hair pencil. Ulcerations may also be usefully dressed by the same, with the addition of tonics internally.—*Ed.*]

STAPHYLOMA.

[So called from its resemblance to a grape.

When young calves, lambs, or pigs suffer from simple ophthalmia, and the system becomes low and weakly, the tenden-

cies of the disease are to typhoid and purulent form of inflammation, succeeded by ulceration and even sloughing. The whole of the contents of the eye are sometimes removed in this way through the cornea. In some instances, however, the disease stops short of that stage, and the result is a bulging of the cornea, termed "Staphyloma."



FIG. 199.—*Staphyloma*
or bulging of the Cornea.

The early symptoms are those of simple ophthalmia; and later, ulceration of the cornea is established, which provides a part of less resistance than the rest of the membranes. This yields to internal pressure, and the grape-like projection is developed. The parts are opaque, vision is destroyed, and danger of total evacuation is to be feared. Sometimes one eye only is affected; but, like the other forms described, this disease may appear as an enzootic, when both eyes of cattle and sheep suffer alike.

Treatment consists of adopting the measures already advocated for simple ophthalmia, of which form of disease this is an extension. Astringent lotions are of great value.—*Ed.*]

FUNGOUS HÆMATODES—BLOOD FUNGUS—BLEEDING CANCER.

[This perplexing and even loathsome affection is frequently seen in cattle, but rare in sheep and pigs. It may arise after several attacks of ophthalmia, by which it is thought to be caused, but more generally it may be viewed as being distinctly of a malignant nature, depending upon a peculiar dyscrasia. *Fungous hæmatodes* consists of a dark coloured, bloody-looking, or vascular fungoid tumour, protruding from any part of the body, growing with a rapidity somewhat surprising, and bleeding profusely, even to the great danger of the animal, upon the slightest disturbance. It is most commonly witnessed in the orbit, where it makes its appearance (Fig. 200), at first as

a small vascular tumour, and by gradual enlargement pushes aside the eyeball, which, together with the bones of the orbit, are at length included in the morbid process. Death results from emaciation and hectic, the result of interference with natural functions, as well as blood poisoning.



FIG. 200.—*Fungous Hamatodes.*

Treatment should be adopted early to ensure success. Caustics or the knife are required, and the state of the eyeball may call for entire removal. The object should be to mitigate the sufferings of the animal as speedily and effectively as possible, in order to gain flesh and fit it for slaughter. If the attempt is not made early, the tendency which the disease always manifests to return will frustrate the ends. Medicines may be necessary, but these are best dictated in accordance with the state of the animal, and under medical advice. It would be impossible to enumerate here the various remedies of service, and as such affections call for the personal attendance of a veterinarian, he is the best judge of what is necessary, being guided by signs that are of very variable occurrence.—*Ed.*]

REMOVING THE HAW—CUTTING OUT THE HACKS.

[This is one of the barbarous tricks sanctioned by ignorance and perpetrated by quackery for the love of gain.

It is commonly supposed by those ignorant of anatomy, &c., that the *membrana nictitans*, or haw, is at least a useless piece of mechanism, if not a morbid growth. In addition, being observed to participate more or less in inflammation of the eye, and mistaking its use in passing over the front to wipe away foreign bodies, in the absence of fingers, it is looked upon as *the cause* of the disease. Its removal, therefore,

becomes an important item; and when owners of pigs and cattle know no better, and shepherds are allowed to do as they like, the operation is very useful in a pecuniary view. We know of many men who make no inconsiderable sums yearly by this absurd practice. Not a pig in their peregrinations escape them, and cows form a most luxurious addition to their prey.

The reader who happens to be ignorant of the absurdity of this practice, is here informed that the haw is a cartilaginous or gristly body placed in the inner angle of the eye, in a bed of fat, which is continued to the back or posterior part of the eyeball. A muscle called the "retractor" (c, Fig. 195) pulls back the eyeball when required, and this pressing upon the

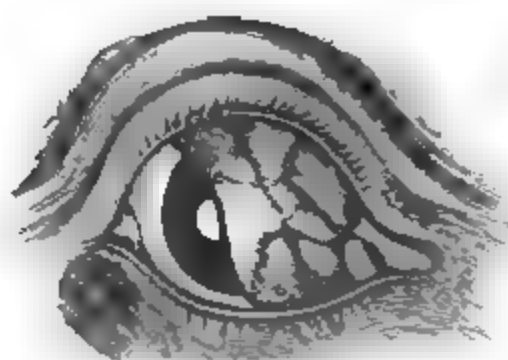


FIG. 201.—*The Eyeball partially covered by the Membrana Nicitans or Haw.*

mass of fat, pushes it forward on the inner side, and carries before it the haw (Fig. 201). By its peculiarity of shape, being triangular and concave, it fits the eyeball accurately on one side, and upon the other conforms to the inner sides of the eyelids, and the latter prove useful in *guiding* the haw

over the cornea. No one ever saw the lower animals attempt to remove foreign bodies from the eye as the human subject can, and in the absence of that ability such a contrivance as we have described is needed. When men propose to remove it upon the strength of excuses that have no reasonable foundation, the proceeding becomes an imposture, and deserves to be treated in a summary method; and when they have tortured an animal by a performance of the operation, those cognizant of it should immediately acquaint the Secretary of the Royal Society for the Prevention of Cruelty to Animals, who would at once set about putting a stop to it in future.—*Ed.*]

SECTION XII.
LOCAL INJURIES.

LOCAL INJURIES.

[These comprise wounds of the skin and deeper tissues, fractures of bones, sprains of ligament and tendon, and certain dislocations and injuries to articulations. None of these, however, are of very frequent occurrence, and in their rarity are usually confined to certain localities, the habits and management of cattle, &c., providing an immunity from many dangers that surround the horse.—*Ed.*]

WOUNDS.

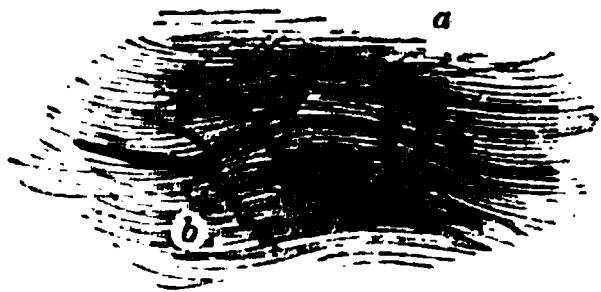
[Four different kinds are recognized in veterinary practice : these are the *incised*, *lacerated*, *contused*, and *punctured*. We append a brief outline of their nature and treatment required.

INCISED WOUNDS.—These are produced by some cutting instrument, which divides the skin evenly, and without loss of any part of it. A great difference exists in the subsequent healing of a wound, as decided by its extent. If small, it unites by what is known as the first intention or adhesive inflammation ; but large ones are sometimes attended by extensive suppuration. Profuse bleeding also is sometimes a disagreeable accompaniment.

Treatment.—When hæmorrhage (which see) is profuse, let the first attention be devoted to it ; if small, simple closure of the wound is sufficient.

Incised wounds, excepting when they occur in the extremities from falling, &c., are usually free from dirt and foreign matters ; but if such are present, or blood-clots, &c., let them

be carefully removed by hot fomentations or poultices if difficulty exists ; otherwise the forceps, the fingers, or handle of a scalpel are sufficient. On no account allow a clean incised wound to be washed, as the coagulum, which is thrown out as necessary for the proper union, is removed, progress hindered if not destroyed, and an unsightly wound produced. Union is to be effected by sutures, of which several varieties are employed. The first is the twisted suture, which consists of passing a pin through the lips of the wound, and drawing them together with soft twine, twisted round in form of the figure 8, as already described at page 40. (Fig. 202.)

FIG. 202.—*Twisted Suture.*FIG. 203.—*Interrupted Sutures.*
a. Thread or Silk. b. Metallic Wire.

The *Interrupted Suture* consists of passing thread, silk, or silver wire, &c., through the lips of the wound, when the two first are tied, and the wire is merely twisted (Fig. 203). The latter is also called the “metallic suture.”

FIG. 204.—*Uninterrupted Suture.*FIG. 205.—*Suture Needle.*

The *Uninterrupted Suture* is formed by passing the thread or silk continuously from one side to the opposite, until the lips from one end of the wound to the other are brought into close approximation. It is only suitable for small wounds. (Fig. 204.)

The *Quilled Suture*.—This is particularly adapted for large wounds, and those where internal pressure is likely to prove

antagonistic to the process of healing, as in the abdomen, flank, &c., &c. A cylindrical piece of wood, of suitable length to the wound, is taken : say three-quarters of an inch in diameter ; and a number of slits are cut round it, corresponding to the stitches that are to be inserted, which should be about one inch apart. This being done, the wood is split up the middle, and all sharp edges pared off. The whole of the stitches are next inserted—thread or wire—by means of a suitable needle, having a triangular point, and more or less curve (Fig. 205), sufficient length for tying being allowed after they are cut off. The sticks are next placed upon each lip of the wound, and the threads, wire, &c., successively brought together, and tied or twisted. (Fig. 206.)

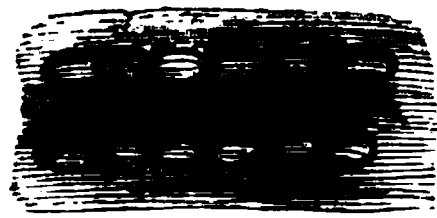


FIG. 206.—*Quilled Suture.*

Suitable dressings for after-use are cold water, lotions of lead, zinc, arnica, or spirits and water, tincture of benzoin, tincture of myrrh, &c. (See Appendix.)

If high febrile action sets in, use the various sedative preparations, as acetate of ammonia, aconite, neutral salts, opium, belladonna, calomel, &c. (See Appendix.) Perfect rest may be required, particularly when the wounds are situate in movable and important parts, and the slings may be called for in order to prevent the animal lying down.

LACERATED WOUNDS.—In this variety separation of the integument is effected in an uneven and irregular manner. The causes are violent blows with rough and knotty sticks, or by coming into contact with hooks or projecting ironwork, kicks from horses, bites of dogs, and attacks from other cattle when the horns are used. There is seldom danger from bleeding, as arteries when torn are apt to contract sufficiently to prevent the flow of blood.

Wounds of the abdomen, when the muscles are divided, however, are frequently fatal, in consequence of the collection

of serum or blood, or both, within the abdomen. Sometimes permanent ventral hernia ensues from tearing of the muscles beneath, but in which the skin receives no injury. These kinds are the result of being gored with other cattle, and seldom call for other treatment except pressure.

Treatment. — Remove foreign bodies by forceps: gentle fomentations or poultices if required; afterwards, and in all clean wounds, if practicable, draw the edges together by sutures. This, however, cannot always be effected, as the vitality of the parts is too much destroyed, in which case use the many-tailed bandage, as shown in Fig. 207. This consists

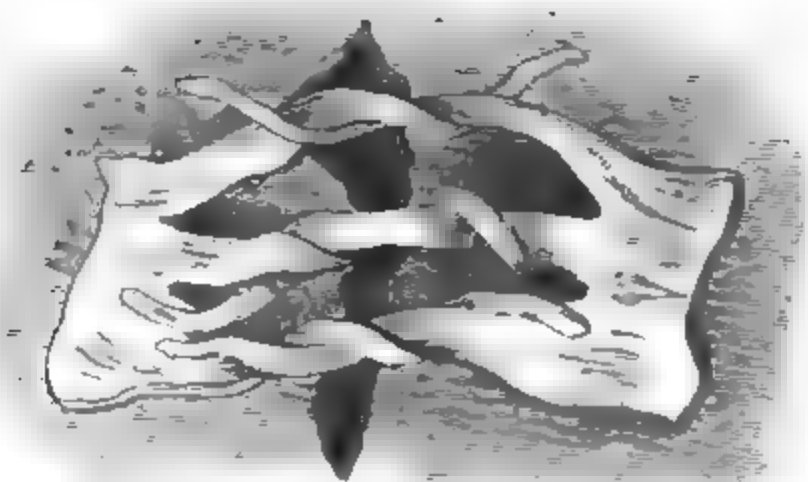


FIG. 207.—*Many-tailed Bandage for large Lacerated and other Open Wounds.*

of two parts, each being a stout piece of canvas or pack-sheet, one side of which is *glued* upon the skin (the hair being previously clipped close), the other being slit up into an equal number of tails. When the glue is dry, the tails are brought forwards and tied, which draws the edges of the wound together. It is also a good plan to put suitable "flat quills" beneath, in order to press down the parts as required.

Provide quietude, light food, and general treatment, as already detailed under the previous variety. Scarifications may be called for in order to reduce local tumefaction, and probably stimulating embrocations as a means of averting

gangrene. If the system affords evidence of shock, stimulants may be necessary, as well as close attention generally.

CONTUSED WOUNDS. — This variety exhibits a wide difference from the preceding. Division of surface or subjacent tissues may have occurred ; and, in addition, there is frequently considerable diminution of vitality in the tissues implicated, which becomes a special feature, particularly as sloughing generally follows, and recovery is slow. Kicks, blows, falls, &c., are common causes, and they are frequently seen as a result of paralysis or other inability to rise, when the animal bruises himself in the attempts to regain his feet. When partial hanging has occurred, sometimes the worst form of contusions are developed, and the like also are seen after animals have fallen into ditches, &c., and could not extricate themselves.

Treatment.—Incessant fomentations for several hours, water being supplied at a temperature of 115° to 120° F., the parts being covered by *spongio-piline*, or several layers of woollen rugs. (See "Fomentations" in Appendix.) Liniments of camphor, turpentine, or ammonia are useful to expedite a restoration of the vascular action, and scarifications are sometimes called for, to liberate turgescence, as well as sub-cellular effusion ; and sedatives generally, as the acetate of ammonia, aconite, and neutral salts, as dictated by the fulness and force of the pulse. When contrary states are present, as shown by the decrease in the strength and volume of the circulatory current, sloughing of the parts may be expected, particularly if they are cold and insensible. Stimulants and tonics, as ammonia (spirits) with quinine, must be diligently employed internally, in conjunction with stimulative embrocations externally. Good food, and particularly the roots, with grass, clover, linseed, &c., and the various kinds of grains, should be supplied in small and repeated quantities.

PUNCTURED WOUNDS are frequently dangerous. Nails, the point of a fork or similar sharp instrument, are the general

causes, and by the ease with which they are introduced penetrate viscera, important blood-vessels, joints, &c., and conditions arise that are not always fully ascertained at the outset. Considerable skill is required in their treatment, and death generally results from implication of the lungs.

Treatment.—The wound should be carefully explored, and all foreign bodies removed as soon as possible. A cool and spare diet is required, and signs of symptomatic fever should receive prompt attention, as already detailed in the preceding varieties, as well as at page 19. In flesh wounds, the free discharge of pus should be provided for by direct incision or injection of dressings daily. In punctures of the joints, the actual cautery, nitrate of silver, chloride of zinc generally succeed in speedily closing small wounds, and even others of larger dimensions with slight modification of principles. In punctures of the feet, poultices and fomentations are required, and as soon as the presence of pus is decided, its evacuation should be secured. Portions of bone separated by fracture or the process of inflammation require speedy removal from the wound, after which astringents may be injected.—*Ed.*]

WOUNDS OF THE ARTERIES AND VEINS—HÆMORRHAGE— PHLEBITIS.

[Injuries to the blood-vessels are not of very common occurrence among cattle. The ordinary causes of wounds are, however, occasionally productive of damage to arteries and veins, when a flow of blood of greater or less extent takes place, constituting what is known as *hæmorrhage* or bleeding. The colour of arterial blood is a bright scarlet, and that from a vein is a dark or Modena red colour. The blood from an artery is further distinguished by the larger volume which is thrown out by successive spurts, having a relation to the pulsations of the heart.

Wounds of the Arteries and Veins. 595

Hæmorrhage is arrested in various ways. Certain substances—known as “styptics,” (see Appendix)—possess the power of contracting the artery and altering the nature of the blood, by which a plug is formed, either in the artery itself or at its open mouth. Mechanical agents, as cotton wool, tow, German tinder, &c., also are effective; and the actual cautery, nitrate of silver, and chemical caustics generally, are probably among the best.

Surgical appliances, as the forceps, ligature, &c., are ready means often employed by the practitioner. An artery is seized by the forceps (Fig. 197, page 582) and twisted, or it is drawn out and secured by a ligature at once near the free extremity. In some instances an artery requires to be taken up at a different point some distance from the seat of injury. It is then cut down upon by a scapel and exposed by dissection, when a needle, armed with suitable thread, silk, &c., is passed beneath, and both ends tightly tied together, being left long enough to hang from the external wound. The edges of the skin are subsequently brought together by sutures, and treated as an ordinary wound.

Bleeding from an artery is always attended with danger, particularly when the incision is made longitudinally. In such cases the vessel should be at once divided across, when it is more likely to arrest hæmorrhage by retraction within its sheath, and subsequent closure by contraction. The external wound is then to be closed and pressure applied, or a false aneurism occurs.

Bleeding from veins is not always of a serious nature, unless a large vessel is the seat. Simple pressure or a styptic is generally all that is necessary. The colour of venous blood is generally present in some extensive hæmorrhages during operations. As arterial blood flows from the bottom of deep incisions or wounds after extensive sloughing, its dark colour, with the constant flow and even pulsating character, bewilders the beholder. The characters of venous and arterial blood are

evidently here combined, but not accounted for; and, if the hæmorrhage is viewed as from a vein or veins, and not at all serious, the animal might be lost in consequence of the belief that no treatment is required. Bleeding *always* requires attention, and, in the absence of surgical aid, should be arrested by applying lumps of tow, cotton wool, &c., &c., whether it be venous or arterial in character. It is not always possible to distinguish between the two, as in the case referred to—blood from an artery passing over other tissues absorbs their impurities, and thus assumes the colour of venous blood.

Another means of arresting hæmorrhage—particularly in the limbs, &c.—consists of tying a soft rope, towel, or handkerchief loosely round the member at a point above the injury; a stick is then passed half-way through, and by twisting it round, pressure is applied and current of blood arrested. This may be rendered much more complete if a bundle of tow, or a small pocket pincushion, pad, &c., is first placed over the course of the artery.

Phlebitis means inflammation of a vein, and is commonly understood to apply to the effects which sometimes occur after bleeding in cattle, after the vein has been struck several times ineffectually, a dirty instrument used, or hairs, dirt, mange insects, &c., &c., have been insinuated within the wound; or, after pulling the skin too far away during the operation of pinning up, blood has flowed into the cellular tissue, forming what is known as a *thrombus*, by which irritation and subsequent inflammation are the consequence. Considerable local tumefaction and swelling take place; the neck generally also swells; and at length a discharge ensues from the original wound. Sometimes considerable irritative fever sets in, and the head even participates in the general swelling. Incessant fomentations are of service; the pin should be withdrawn and repeated; blisters also placed over the course of the vein, or the actual cautery may be applied. The usual results are loss

of the vein, when such an animal will not graze without suffering from considerable swelling of the head.—*Ed.*]

FRACTURES.

[Bones frequently suffer from injuries in such a manner that their continuity is destroyed, or, as it is expressed in technical language, they are fractured, and in the vernacular, broken.

A fracture is said to be *transverse* when the broken surfaces are at right angles with the bone itself.



FIG. 209.—*Transverse Fracture of Bone.* FIG. 210.—*Oblique Fracture.*

It is *oblique* when the surfaces are caused to observe a direction from one side to the opposite, terminating at a point considerably above or below that at which it originally commenced, *comminuted* when the bone is reduced to many small pieces, and *compound* when the ends of the bone protrude through wounds in the flesh and skin.

The only manageable kinds among the lower animals are the two first, although under certain conditions a compound fracture may be sometimes reduced and recover. Among cattle and sheep an attempt to set a fractured limb should always be made when the bone affected is below the elbow or stifle. In other situations there is not much hope of success, in consequence of the mass of muscle that is present and interferes with the proper application of appliances.

Symptoms.—Fractures are denoted by great lameness, inability to rest on the limb, intense pain, and tucked-up

appearance of the animal, all of which have arisen *very suddenly*. Sometimes considerable swelling is seen over the affected part, and upon manipulation crepitus or a grating sound is heard. Deformity, shortening, and great displacement are also sometimes accompaniments.

Treatment of fractures is not always attended with success, owing to the extreme difficulty in keeping the animal sufficiently still, from which continual displacement occurs. By the aid of stout sheets of gutta-percha and starch bandages, &c., a tolerable recovery frequently takes place, their mode of application being as follows :

Two strips of gutta-percha are cut off corresponding in length to the fractured bone. In width they answer to half the circumference, provision being made for the widening above. Each is to be placed in hot water, and when sufficiently softened are bound upon the front and back respectively of the *sound* limb, by which a sufficiently near shape is acquired. The affected bones being approximated as required, a thin bandage is then equally bound over the parts, and the gutta-percha splints, which have again been warmed, are placed over the top and covered in turn by another roll of bandage.

Starch bandages consist of the usual strips of canvas, &c., about three inches wide and two to five yards long. These are thoroughly saturated in a stiff solution of starch, and bound repeatedly over the limb after being properly set. In a few hours they are dry and assume an amount of firmness which effectually provides sufficient support in keeping the parts together.

Plaster of Paris is sometimes used, the parts being well greased before it is applied. There are, however, objections to its use. Pitch, with tow, the former in a melted state, also is resorted to, but the practitioner of skill will succeed with the two first more frequently. After-treatment requires to be of a most careful character. The animal should not be allowed

Sprain of Ligament of Hip Joint. 599

to roam about in search of food or water, and great attention should be paid to regular feeding. If great swelling occurs, the splints may require to be loosened or replaced, and if they are moved, an examination should follow in order to ascertain the exact condition. If displacement of the bones have occurred, their position should be restored at once. With these means the animal may be allowed a comfortable box, and after a few days have elapsed it will be generally found to have appreciated its position, and taken every care of the affected limb.

Fracture of the haunch-bone (*os innominata*) is common among cows, from their running violently through doors or against posts and projecting objects.

The anterior spinous process is the common locality, after which the hips are termed "ragged," one being lower than the other.* In certain instances, fracture occurs across the shaft or *acetabulum* (hip joint), but, owing to the amount of muscular tissue, there is little or no displacement, and as the movements of the animal are restricted, union occurs readily. Stimulative embrocations externally greatly promote the recovery.—*Ed.*]

SPRAIN OF THE ROUND LIGAMENT (*Ligamentum Teres*) OF THE HIP JOINT.

[This is a much more common affection than is generally admitted. It is caused by kicks from horses, falls, blows, other cattle leaping upon them, &c., and is known by the following

Symptoms.—Flexion of the affected limb during rest, and drooping of the haunch of that side. Inability to raise the thigh and advance the leg; therefore there is no flexion in progression, and the hoof is dragged on the ground. Absence of swelling and pain in other parts generally suffices to direct

* In some districts the cow is said to have a "huggin down," or has "dropped her couples."

attention to the hip, and manipulation of the limb causes great pain. External pressure rarely detects anything satisfactory.

In chronic cases wasting of the muscles of the haunch and thigh is observed, and sometimes abscess of the joint ensues; and when absorption of the matter has taken place, a loud clicking noise is heard during progression.

Treatment.—Reduce the inflammation by the use of sedatives, laxatives, &c., internally, and cooling lotions externally, as detailed under heads that follow. Ensure perfect rest and quietude, with regular system of feeding, &c., and when turned to pasture select level ground, with few and quiet companions. Such is the tendency of severe lameness in cattle that condition is very frequently destroyed for months. We therefore recommend that all cases of this kind be promptly investigated by skilful veterinarians and their advice followed, that the acute stages being more readily subdued, the time lost and sacrifice of condition will be generally slight or scarcely felt.

When abscess of the joint has ensued, it is frequently associated with a scrofulous diathesis, and treatment is not always followed by success.—*Ed.*]

INJURIES TO THE FEMORO-TIBIAL ARTICULATION OR STIFLE JOINT (*Traumatic Arthritis*).

[Young growing cattle grazing in hilly districts are very liable to this affection as a result of the continued tension that is thrown upon the various ligaments. Adult animals suffer from kicks, blows, falls, and the common practice of running in company through doorways. It is frequently confounded with dislocation of the patella by non-professional persons and empirics, and treated as such without success.

Symptoms.—More or less distension of the capsule of the joint. A soft fluctuating swelling internally, and extending backwards, indicates the injury is confined to the inner synovial

cavity and structures contained within it. External swelling is limited to the corresponding structures of the outer cavity, the crucial ligaments and reflection of two synovial membranes being the medium of division between each. When the articulations of the trochlea and patella are affected, swelling is superiorly and in front: it surrounds the patella as well as extends above it (Fig. 211).



FIG. 211.—*Stifle Joint after severe Injury.* FIG. 212.—*Ox with Injured Stifle Joint.*

a. Swelling above and on the side of the Patella or Knes-cap; *b b.* Swelling denoting injury of the Femoro-tibial Articulation or true Stifle Joint; *c* Front of the Joint.

In severe cases affecting the joint of adult animals the whole of these synovial cavities are involved, when great pain and diffused swelling exists. In all the power of flexion and extension is attended with great pain; the animal goes on three legs, holding up the affected limb in a state of semi-flexion, which position is seldom altered (Fig. 212). The animal avoids movement of all kinds, and even refuses to lie down for some time.

Apparently less serious cases are those assuming a chronic state. The weight is partially borne, but the limb is always carried stiffly; the steps are short and in advance of those made by the opposite limb. Lying down and rising is not

effected without considerable pain, while pressure from the fingers, exerted upon the capsule or ligaments, produces flinching in the early stages. The appetite is at first affected by the prevalence of some amount of fever, and considerable emaciation also follows. Such cases are of long duration, and require ample rest, with active measures in the earlier stages.

Treatment.—Exhibit laxatives at occasional periods throughout the disease, and in the first stages sedatives should be regularly administered. Cooling lotions are called for also; and after the fever and inflammation are subdued, counter-irritants and even the actual cautery are indispensable.

Post mortem Appearances.—Considerable accumulations of synovia are present at first, but as the disease advances, the cavities are more or less filled with lymph. All the vascular structures are acutely injected, and some of the ligaments—particularly those of the discs—are lacerated, and the inter-articular discs themselves softened and partially absorbed, especially the inner ones. In more advanced cases the bones are inflamed and asperous, the articular cartilages are removed, and *eburnation* follows: in short, the articulation is being gradually obliterated by foreign deposit, and ankylosis is proceeding with certainty.—*Ed.*]

DISLOCATION OF THE PATELLA OR KNEE-CAP.

[This is rather a common affection among stock grazing upon hilly pastures. It appears to be a result of weakness or relaxation of ligament, due to rapid growth in young animals, and in adults when reduced by previous disease, the character of the ground acting as an exciting cause. In some instances the dislocation ensues from running through narrow doorways, or striking violently against projecting objects.

The *Symptoms* are unmistakable. The patella is displaced outwardly, and appears as a well-defined hard tumour upon

the external aspect of the stifle joint. A large depression also exists in the proper position of the patella, at the *front* of the joint.

The inner lip of the femoral trochlea, being the largest, rarely admits of dislocation in that direction. In progression

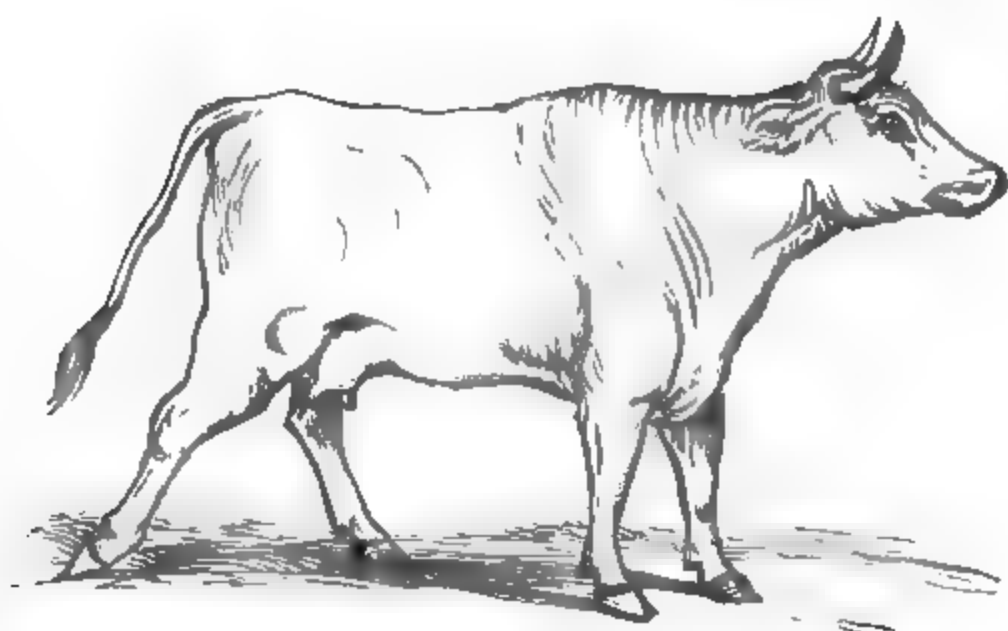


FIG. 213.—*Dislocation of the Patella.*

the whole limb is rigid ; in extension powerless, but vigorously drawn backwards (Fig. 213), while the fetlock and foot are flexed to the fullest extent. The animal hops on three legs, while the affected limb is dragged afterwards, the foot and even the fetlock touching the ground. Pain and heat, with some amount of swelling, is present at first, but as time passes these disappear, the ligaments elongate, and the outer lip of the trochlea is worn by the false position of the patella. When this has fully taken place dislocation is constant, and accompanied by a sharp cracking sound in progression, caused by the bone under pressure of the muscles and ligaments repeatedly flying back into its proper position, but from the deformity alluded to unable to remain.

Recent cases only are reducible and recoverable. Animals

thus affected require prompt measures, great care, level floors, and perfect rest.

Treatment.—Pass the loop end of a halter round the fetlock of the affected limb, and direct assistants to draw it forcibly upwards and forwards towards the abdomen, the rope being passed between the extremities. Grasp firmly the muscular part of the leg with one hand—*pulling outwards*—and with the other placed securely upon the patella, *push inwards*. Reduction is seldom of a difficult nature. A collar should now be improvised, either an old horse-collar cut open at the top so as to admit of being put on, and afterwards tied with rope round the place where the hames rest, or one of flat webbing, rope, &c.; and to this secure the rope from the foot (Fig. 214), which should be so short as to cause the affected limb to be considerably in advance of the sound one.

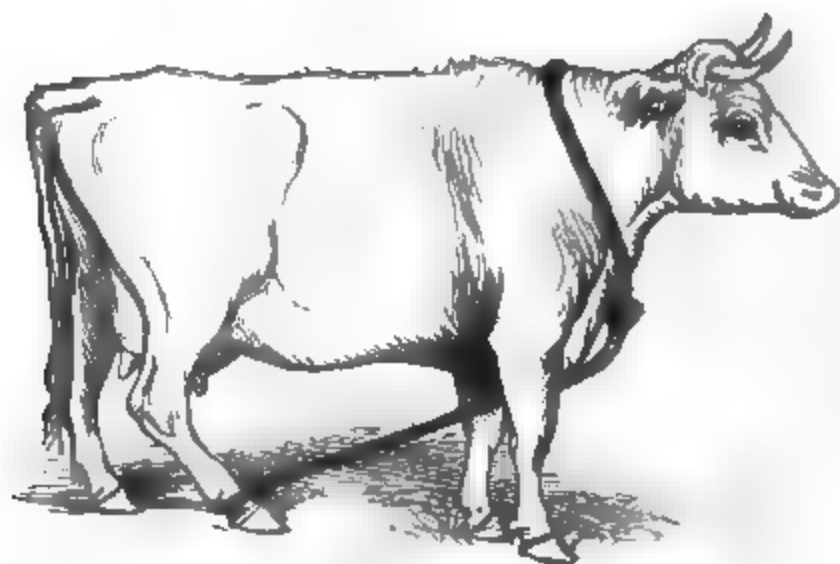


FIG. 214.—*Mode of securing the Hind Leg, to prevent a recurrence of Dislocation of the Patella.*

When febrile symptoms run high, treat as under symptomatic fever, and upon the outside of the joint place a strong blister. When great weakness is the cause, allow good food, and select a level pasture when the animal is to be turned out again.—*Ed.*]

SPRAINS OF TENDON, &c.

[As a result of irregular floors, long hoofs, hilly pastures, &c., sprains of the ligaments and back tendons of the legs in the vicinity of the fetlock joint are common. Considerable pain, swelling, and lameness are the result in all acute and recent cases, and, aided by a knowledge of the situation of the various structures, a case of this kind is generally understood very readily. The foot is usually flexed, and a great disinclination to put weight upon the limb is evident.

Treatment consists in the exhibition of purgatives and sedatives, as circumstances require. The former should always be used when constipation is present, and sometimes they will form the principal internal remedy.

Cooling lotions are of immense service during the existence of inflammation. The following are the usual forms :

RECIPE NO. 169.

Take of spirits of wine	2 oz.
Water	1 pt.

Mix.

RECIPE NO. 170.

Take of spirits of wine	2 oz.
Acetate of ammonia	4 „
Water	1 qt.

Mix.

RECIPE NO. 171.

Take of sal ammoniac	2 oz.
Dilute acetic acid	16 „
Spirits of wine	2 „

Mix.

In such case a linen bandage is to be applied to the part and kept constantly wet with the mixtures, or they may be applied with moderate friction.

The use of these lotions should be persistent, or no good will result, and in case any difficulty attends this mode of

treatment, hot fomentations may be substituted, if they can be applied with diligence.

As soon as the high vascular action is reduced and coolness is noticeable in the parts, a stimulant may be applied such as the following :

RECIPE NO. 172.

Take of soap liniment	8 oz.
Solution of ammonia	1 „
Tincture of opium	3 „

Mix.

To be applied once or twice a day with smart friction.

Rest, level pastures, and attention to the state of the hoofs are indispensable items.—*Ed.*]

SECTION XIII.
P O I S O N S.

POISONS.

The lower animals suffer more frequently from the effects of poisonous substances than is usually supposed. Like many other departments of veterinary science, this has not progressed as is desirable, from the general principle hitherto adopted, viz.: the employment of illiterate men in the treatment of the diseases of cattle, and the rarity of allowing careful *post mortem* examinations by educated men as a means of investigating the causes of disease. The addition of botany to the curriculum of study in our veterinary schools must add considerably to the power of discrimination in the practitioner, which the educated agriculturist will fully appreciate. Quackery will always have a throne, and its impostures upon the owners of stock will continue to be exerted as it is this day upon a class who do not care to go into details. But as our agriculturists gain greater ascendancy, their acquirements must gradually assume a higher order, and they will prefer a scientific explanation and dealing rather than submit to doubt, fraud, and mystification.

The subject of Toxicology, or the doctrine of poisons, is as comprehensive as that of disease generally, and were we to do it the justice it deserves, the whole of this treatise would fail to exhaust it. In the limited space even of this section, however, the reader will not fail to decide in favour of its importance, and, we trust, endeavour to promote its application still more to our domestic animals.

Poisons—toxic agents—present an extended and complex

classification which we at present cannot dilate upon. The purpose of this section will be fully accomplished by the following brief summary.

Noxious substances coming within the meaning of the term "poisons" are derived from the animal, vegetable, and mineral kingdoms, and are subdivided thus :

I. SIMPLE IRRITANTS.—Substances that irritate and inflame the parts with which they are in contact.

II. CHEMICAL OR CORROSIVE IRRITANTS. — Substances that enter into chemical combination with the tissues, forming definite compounds, and otherwise carbonize, disorganize, or destroy them.

III. NERVINE POISONS act in several ways. 1. Upon the brain : these are called *cerebral* poisons. 2. Those whose action is confined to the spinal cord are denominated *spinal* poisons. 3. A combination of these effects in one substance stamps it as *cerebro-spinal* poison. 4. As a subdivision of these kinds we find other agents not only partaking of the above characters, but through the agency of an acrid volatile oil contained within them, obvious irritant effects are also produced : these are known as *narcotico-acrid* (or irritant) poisons.

The death of animals is caused by poisoning in three ways, viz.: *empirical practice*, by *accident*, and with *malicious or wilful intent*.

In EMPIRICAL PRACTICE farriers, cowmen, shepherds, and even farmers, &c., make use of remedies of the action of which they are in total ignorance, and death results from conditions that are not only misunderstood, but more frequently unobserved until too late. Thus *mercurial ointment* is extensively used to destroy skin parasites of all animals, and fatal mercurialism is produced. *Arsenic* and *corrosive sublimate* are used for similar purposes, and, in the form of an ointment, as a specific for the so-called cancerous growths and warts in cattle and other animals. The same ingredients also are employed

extensively for sloughing purposes in various other diseases, and fatal absorption ensues. *White* and *black hellebore* respectively are used as specifics in various diseases, and as a seton in the dewlap to prevent carbuncular fever, by which scores of animals die yearly. *Common salt*, although a most useful condiment, proves fatal to many cattle, sheep, and pigs. *Aloes* and *opium* are too frequently prescribed, with a great want of knowledge of the animal body, by druggists and others. *Tartar emetic* is purchased by quacks, in quantities of not less than fifty-six pounds half-yearly, to form the chief bulk of their horse and cattle powders for every ailment; and *nitre* and *sulphur* solely constitute the powders sent out from some learned establishments in alarming parcels, and the druggist adds his mite of knowledge by combining *black antimony* with them. Besides, *acetate of ammonia*—usually believed to be a stimulant—accomplishes in unskilful hands most deadly acts. *Aconite* produces equally alarming states, and *sulphate of iron* is not one whit behind the whole from the careless mode in which it is prescribed.

ACCIDENTAL POISONING occurs in a variety of ways. Those who are in the habit of prescribing for and treating their own animals are frequently very careless. Packets of medicine, &c., are allowed to lie about on the corn-bins, accessible shelves, or projections of wood, stone, &c. The poison for rats and mice is also incautiously placed, and when animals roam at will through buildings, or mischievous boys commence their gambols, these dangerous and foreign articles are dispersed, and not unfrequently thrown direct among the food. Sometimes, from the absence of proper labels or marks, poisons are substituted for simple remedies; at others they are thrown upon the manure-heap, and if not speedily consumed, are conveyed to the land, and work irreparable mischief on some future and unlooked-for occasion. Pigs are poisoned by the brine which is frequently mixed with their food. The leaves of mangold-wurtzel

also prove very deadly. When animals return from a long journey, and are turned hungry into bare pastures; or after dry summers and scarcity of food, break into shrubberies or copses, and browse upon poisonous plants, or at least upon those unnatural and unfitted as their food; or when trees have been trimmed, their branches thrown within reach are devoured, and in this way yew, laurel, rhododendron, hollyhock, and oak prove fatal. Acorns, after having fallen to the ground, are sometimes swallowed in large quantities in dry seasons, and colchicum, beech-nuts, cow-parsnip, sow-thistle, hemlock, poppy-plant, upas-antiar, &c., are also partaken of, inducing serious if not deadly effects.

Prior to the nature of these plants being known, the disease they induced in animals which had devoured them was known by the terms "Wood-evil," "Pantas," "Moor-ill," &c. Although death resulted in many instances, it by no means

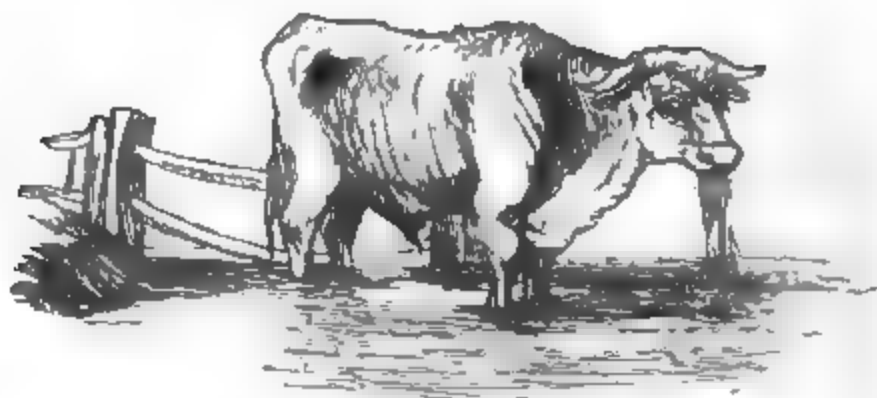


FIG. 215.—*Gastro-Enteritis.*

followed that an actual poison was the cause. Indigestion of a most acute and intractable nature is produced, impaction of the omasum follows, succeeded by diarrhoea and dysentery. True poisoning, therefore, must be distinguished from severe indigestion, the result of consuming large quantities of vegetables or plants, not in themselves poisonous, but being unsuited as ordinary food, produce derangement of the digestive organs, with nervous complications, which terminate fatally. These

conditions are already discussed under appropriate titles : thus, irritant poisoning will be found under "Gastro-Enteritis," page 321, and the effects of foreign but innocuous substances taken in undue quantity, described as "Acute Indigestion of the Rumen and Omasum," pp. 282 and 293. (Fig. 216.)

A careful distinction between poisoning by vegetables, &c., growing in our pastures, and the results of inordinate consumption of harmless plants, is of great importance to the veterinarian. The ability to arrive at such is decided by a knowledge of botany, but without which a great deal is taken

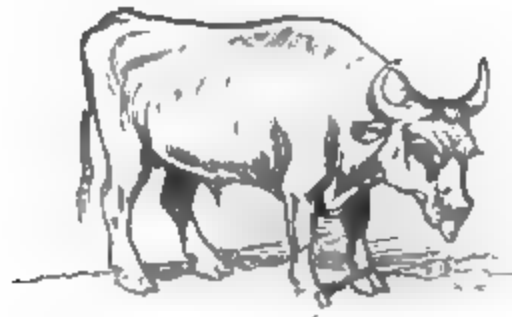


FIG. 216.—*Impaction of the Omasum.*

for granted that is not proved, a result that has already exerted a baneful effect in more instances than one. This has been the case with the *althea rosea*, or common hollyhock. From an ignorance of the botanical characters of plants, and this in particular, the death of animals after a hearty meal of the leaves and flowers has been ascribed to a poisonous alkaloid. We are, however, now certain that the members of the tribe *malvaceæ*, or marsh-mallow family, are possessed of no poisonous alkaloid ; and therefore, when death results after partaking of them, it occurs in the form of an acute and violent indigestion. Similar charges have been brought against the young shoots of oak trees and acorns, but a mature examination has shown that true poisoning has no part with either.

WILFUL OR MALICIOUS POISONING is not uncommon. It may generally be traced to ignorant and spiteful *employés*,

discharged workmen, &c., who rarely execute the details of their foul practice in a clever manner. Ordinary and available poisons are mostly employed, as arsenic, phosphor paste (phosphorus), rat powder (strychnia, arsenic, baryta, corrosive sublimate), savin, mineral acids, terchloride of antimony, &c. Pigs have been poisoned by the tersulphuret of antimony, commonly known as "black antimony," for an account of which see the "Veterinary Review," Vol. VII., page 337.

Symptoms of Poisoning.—Great similarity exists in the form in which many diseases are presented and the signs by which poisons are denoted. There is, however, one particular distinction of importance, viz., *the sudden appearance of the symptoms after a meal*, or in combination with certain circumstances, as turning upon a pasture, connection with some particular operation, as the use of any preparation of a medicinal character, &c., &c. Then there are additional signs special to each poisonous ingredient : thus, sudden diarrhœa or even dysentery may characterize arsenical and mercurial poisoning, while salivation and loosening of the teeth belong specially to mercury ; but salivation, with swelling of the eyelids, fœtor of the breath, &c., are also seen as special signs of arsenical poisoning.

The various mineral acids and caustic alkalies produce erosions of the mouth, &c., staining of the teeth, inability to eat, gastro-enteritis, and death ; hellebore, severe depression, nausea, copious flow of ropy saliva, attempts to vomit at times, gastro-enteritis, and death. Aconite causes profuse foaming at the mouth, champing of the jaws, hiccough, besides abdominal pain ; strychnine, violent convulsions. In the neighbourhood of lead works paralysis is common, from absorption of lead in a minute state of division, and more acute signs, as frenzy, occur after large quantities are taken. Arsenic taken into the system after being deposited upon the vegetation in the vicinity of copper works gives rise to enlargements of the bones of the joints, great lameness, and eventually emaciation and death.

Treatment of poisoning depends very greatly upon the substance which has been administered. In some instances certain agents are given, which, by entering into chemical union with the poison itself, produces a third totally different and inert compound. Such a substance is known as an *antidote*, and for the various poisons different antidotes are required.

It is impossible to treat cases of poisoning properly without a knowledge of the nature and properties of not only the obnoxious agent, but also of that used as a destroyer of the poison. Much evil is apt also to result from the agency and selection of antidotes, for, being in themselves capable of chemical action, the production of even a more poisonous compound may be the result. This fact renders the study of poisons and their treatment one of the most profound in any department of veterinary science, and to attempt to discuss the nature of antidotes in such limited space in a treatise of this kind would tend to render the whole incomprehensible rather than benefit to the stock-owner. A good knowledge of the domestic treatment required will more efficiently answer his purpose, which being energetically carried out, will in many cases bridge over sufficient time until proper aid can be obtained. It should also always be the practice to send to a practitioner every information connected with the known cause of poisoning, otherwise he may arrive unprepared. The safest way is to send a *written note*, and thus prevent mutilation of important messages.*

When sudden cases of disease arise, and these are attributed to the presence of poison, attention should be directed to the alleviation of symptoms as much as possible. Thus, when profuse diarrhoea and dysentery prevail, large quantities of thick flour or starch gruel, milk, and even eggs beat up, are

* See "The Horse-Owner and Stableman's Companion." London: F. Warne and Co.

valuable. If arsenic, corrosive sublimate, calomel, &c., are present, the above, as well as broths and soups, are valuable agents to restrict and weaken the powers of the poisons. When acute abdominal pains ensue in addition, doses of tincture of opium, or the extracts of belladonna, hyoscyamus, &c., are particularly valuable. This treatment also answers well after animals have taken many vegetable poisons, as colchicum, hellebore, &c. If great depression ensues stimulants should be added, as brandy, whisky, rum, gin, wines, ammonia, nitric or sulphuric ether, &c.

When acids have been swallowed, plenty of milk, with large quantities of carbonate of soda, should be given; and when the caustic alkalies, as potash, ammonia, soda, &c., are present, linseed or rape oil may be given in large quantities, or vinegar when at hand. Soups and broths are also very valuable.

The veterinary surgeon will readily supplement this treatment on arrival if all facts are laid before him; but nothing paralyzes his hands so much as to request his assistance in an urgent case when all facts as to causes are withheld from him.*
—*Ed.*]

* A mass of concise information relating to the subject of this and preceding sections, will be found in the Editor's work, "Memoranda for Emergencies." London: John Churchill & Sons.

APPENDIX.

APPENDIX.

REMEDIES EMPLOYED IN THE TREATMENT OF THE DISEASES OF STOCK GENERALLY; THEIR USES AND APPROPRIATE DOSES.

[A knowledge of the general characters and actions of many of the more common drugs is by no means of difficult attainment, nor when acquired does it form more than a thousandth part of veterinary efficiency. Skilful treatment depends upon mature knowledge of the animal body in all its most intricate constitution, and by which only a correct judgment can be formed of actual states not characterized by intelligible signs. A knowledge of the properties of a drug is a matter of little moment in the whole science of medicine, but to know *when* to administer it is profound; nevertheless, that little judiciously applied may be made the means of saving valuable lives. The exhibition of remedies should be undertaken with the view of palliating cases until a properly qualified practitioner can arrive; beyond that we advise no one to go: amateurs in physic, as in other profound branches of study, never can acquire such information as may be turned to very profitable account; more frequently gross errors are perpetrated.—*Ed.*]

ACETATE OF AMMONIA.—(*See Ammonia.*)

ACETIC ACID.—A powerful vegetable acid, obtained by the destructive distillation of wood. It is generally used as a caustic to warts, and for the suppression of too luxuriant granulations, fungoid growths, &c. Diluted with water, it is used as an antidote against poisoning by the caustic alkalis, and with water and sal ammoniac it makes a very effective cooling lotion. Its forms are—

1. DILUTE ACETIC ACID. RECIPE NO. 173.

Take of acetic acid	1 part.
Distilled water.....	7 „

Mix.

2. COOLING LOTION. RECIPE NO. 174.

Take of dilute acetic acid	1 pt.
Sal ammoniac	1 oz.
Spirits of wine.....	2 „

Mix.

3. COOLING LOTION. RECIPE NO. 175.

Take of dilute acetic acid	1 pt.
Acetate of ammonia	4 oz.
Spirits of wine.....	2 „

ACONITE (Wolfsbane, Monkshood).—An excellent remedy in acute fever, but requires great caution in use, as poisoning is apt to occur if continued too long, or when given in too large quantities. The most reliable preparation is Fleming's Tincture of Aconite—the dose of which for cattle is twenty to thirty drops, calves and sheep, six to twelve drops, which should be gradually lessened at each administration until ten and four or five drops respectively are given, when it may be prudent to withdraw its administration altogether, or continue at most only a few hours longer. It is usually combined with the acetate of ammonia.

ÆGYPTIACUM.—A mixture of honey, vinegar, and verdigris in the following proportions:

ÆGYPTIAC. RECIPE NO. 176.

Take of strong vinegar	17 parts.
Honey	14 „
Verdigris	5 „

Mix.

Used by some practitioners as a corrective to unhealthy wounds, foul, oot-rot, &c.

ALCOHOL.—When sugar or any kind of grain is distilled, a clear volatile ethereal fluid is obtained, termed alcohol or spirits of wine. Its principal use is to make tinctures, and evaporating as well as cooling lotions. (*See Acetic Acid.*) The former is thus made:

EVAPORATING LOTION. RECIPE NO. 177.

Take of spirits of wine	2 oz.
Water	1 pt.

Mix, and apply to the inflamed part by means of a thin rag or bandage, which should be kept constantly wet.

The various stimulating fluids, as brandy, rum, gin, &c., owe their properties to alcohol, which is present in the following proportions: Brandy, 55 per cent.; rum, 53; gin, 51; whisky, 54; sherry, 15; port, 16; strong ale, 8; stout, 6; mild ale, 4; common beer, 1 per cent. The use of alcohol in its various forms is attended with much benefit in the treatment of diseases among cattle and sheep, and should rightly follow the administration of purgatives in obstinate constipation, when ammonia is combined with it. The doses of the stronger spirits, as brandy and whisky, varies: one or two tea-spoonfuls for a lamb, and half to a whole bottle for adult cattle at times are given; sheep and calves one-half to a whole tea-cupful, diluted with ale or porter, gruel, water, &c.

AMMONIA.—Several compounds of this salt are in use. The *Sesqui-carbonate* is given as a stimulant in doses of two to four drams to cows, &c.; one to two for calves and sheep; half a dram for lambs.

Spirits of Ammonia.—Solution of ammonia in spirit. A stimulant. Dose for cattle, two to four ounces; calves and sheep, two to six drams; lambs, one or two drams.

Liquor Ammonia.—Solution of ammonia in water. Also a stimulant. Dose: Half to one ounce for cattle; calves and sheep, one dram; lambs, half a dram. N.B.—These doses should be given *very largely diluted* with ale, water, &c., as they are apt to excoriate the mouth. They also call for frequent repetition, as the effects are very transient. Ammonia in the above forms is an admirable corrective in hoven as a nerve stimulant.

Acetate of Ammonia (Mindererus's Spirit).—A valuable sedative and solvent to the blood in inflammations. Dose: Three to six ounces for cattle; one to two for sheep and calves; half an ounce for lambs. It is usually combined with aconite, and should be given every four or six hours. With acetic acid it forms a good cooling lotion.

Sal Ammoniac.—Dissolved in dilute acetic acid, a good application is made for inflamed surfaces. It should be used as it dissolves, in order to obtain the greatest amount of cold.

ARNICA.—The tincture of arnica is used as a remedy against bruises, and for wounds, &c. For these purposes it is mixed with water in the proportion of one ounce to a pint of the latter, and applied frequently by means of a rag or soft sponge.*

ALUM.—Lotions of alum are useful for several purposes, and are therefore made of variable strength. For simple matters one or two drams to a pint of water may answer, while others require two ounces. Alum is a useful astringent, and mixed with milk is useful in diarrhoea. (See page 315.)

ANTIMONY.—Several compounds of this metal are used. The *butyr* or *terchloride* is a caustic, and is used as such for warts, foul, foot-rot, bites, &c. It will not mix with water without suffering complete decomposition.

Tartar Emetic.—Emetic tartar is not useful as a medicine among cattle, but, on the contrary, liable to produce serious after effects. It is an emetic to the pig.

Black Antimony.—Sometimes used as an alterative. It can be well dispensed with in cattle and sheep. Among pigs it is used as an alterative in doses of one or two drams daily.

ARSENIC.—Useful in skin disease. Fowler's Solution may be used to cattle in doses of one to two ounces; sheep and calves, half to one ounce; lambs, one to two drams, once or twice daily. As a remedy for all pur-

* It is very probable that much of the praise bestowed upon this preparation is without foundation; and when good has arisen from its use, the spirit may be deemed the only agent in the process.

poses, arsenic is uncertain and dangerous, unless employed under proper supervision.

BELLADONNA (Deadly Nightshade).—In the form of extract this proves a valuable remedy in severe pain and inflammation as an external application, also for dilating the mouth of the womb, and relieving spasm of the neck of the bladder. A prescribed quantity is rubbed down with water in a mortar to form an emulsion, when it can be applied more readily by means of a sponge, or injected by a syringe. Poisoning is apt to occur from too large use; it therefore requires great caution. Internally it is given to allay spasm—in doses of two to four drams—in the ox, &c.; half a dram to a dram in calves and sheep.

BLUE VITRIOL.—(See Copper.)

BLISTERS.—(See Cantharides.)

BOLE ARMENIAN.—One of the argillaceous earths, having a slight astringent effect when used as a powder. It is used to mix with others to reduce their active properties.

BURGUNDY PITCH.—Used to stiffen the ointments employed in dressing feet.

BUTYR or TERCHLORIDE of ANTIMONY.—(See Antimony.)

CALAMINE.—(See Zinc.)

CALOMEL.—(See Mercury.)

CAMPHOR.—In small doses this proves a useful stimulant, and may be given in doses of half a dram to a dram to cattle; ten to fifteen grains for calves, sheep, and lambs. As a sedative it is used in doses two or three times the above. Its proper administration is by solution in spirits of wine, and as such forms a good application to stop gangrene, and restore the circulation in a contused part. The proportions are one dram of camphor and one ounce of spirits of wine. Equal parts of this solution, tincture of myrrh, and tincture of aloes, is a valuable application for deeply punctured wounds. Water, and all fluids containing it, throw down the camphor from its solution in spirits.

CANTHARIDES (Blistering Flies).—These are the active ingredients of ointments known as *vesicatories* or blisters. One part of powdered flies is mixed with six parts of lard, and gently heated for two hours; one part of powdered resin and two parts of spirits of turpentine, already mixed, are afterwards added, and the whole thoroughly incorporated. A strong tincture of cantharides is made by adding one pound of flies to one gallon of turpentine. If these are not sufficiently strong for cattle, the addition of one part of croton oil to every ten will create a powerful irritation.

Cantharides must never be used when any irritation of the kidneys, bladder, &c., exists, as, by absorption, the existing disease may be aggravated. For the forms of blister, see Recipes Nos. 7, 8, 9, 10, 62.

CARBOLIC ACID.—A valuable application to foetid ulcers and certain skin

diseases. It should be kept ready dissolved in an equal weight of pure glycerine, that in prescribing it a given measure of the solution will correspond to the same weight of carbolic acid. In this form it readily mixes with alkaline solutions, water, tincture of opium, &c., &c.

SOLUTION OF CARBOLIC ACID. RECIPE NO. 178.

Take of crystallized carbolic acid 4 oz.
Pure glycerine..... 4 „

Mix, and dissolve.

Each fluid ounce, by measure, of this mixture contains an ounce of carbolic acid.

CARRAWAY SEEDS when ground form very useful agents to mix with other stimulants, stomachics, purgatives, &c., to promote their action and prevent griping. They belong to the class of medicines called carminatives—agents that dispel wind. In all cases they should be sound, dry, and fresh when used.

CARROTS.—Although an article of diet, they form one of the most useful agents in restoring the appetite and promoting fluidity of the blood in typhoid diseases, by reason of the salts contained in them, besides being cooling and laxative.

CASTOR OIL.—A very uncertain and nauseating purgative, and, therefore, not serviceable in the treatment of disease among the lower animals.

CATECHU.—One of the valuable vegetable astringents used as medicine. It is prescribed in the form of an electuary in sore throat and affections of the mouth, a form of which is as follows:

ELECTUARY. RECIPE NO. 179.

Take of powdered catechu 2 oz.
Honey or treacle..... 10 „

Mix. A table-spoonful to be placed on the tongue two or three times a day.

Catechu is a valuable remedy in diarrhœa, and may be given in doses of two to four drams to cattle, one to two drams for sheep, calves, and large pigs, and fifteen to thirty grains to lambs and small pigs. The solution in spirits is useful as an astringent and as a cooling lotion to inflamed surfaces.

CATHARSIS or ACTIVE PURGATION IN CATTLE.—The proper establishment for catharsis in bovine animals, during the existence of disease, is frequently an affair of great importance; but from the enormous quantity of ingesta which the stomach usually contains in its first and third compartments, combined with an acknowledged insensibility or indisposition to respond to the action of medicines, it is also apt to become one of great difficulty.

These animals also possess a peculiar idiosyncrasy or peculiarity of

constitution, which eminently unfits them to bear the continued effects of depletive measures of the nature referred to. It is decidedly unsafe, as a rule, to rely upon small and repeated doses of cathartic medicine; such are usually absorbed, and, failing to remove the obstruction as purgatives, produce a mischievous depressant effect by impoverishing the blood, through which desirable results are not unfrequently removed to inaccessible limits.

The most desirable plan is to administer a full-strength cathartic into which enters a *variety* of substances, as salines, mercurials, vegetable purgatives, and stomachics: The animal should be encouraged to take air'd water *ad libitum*, and every domestic comfort ensured; but on no account must the cathartic be repeated. The after-treatment consists of the repeated administration of nerve stimulants, as ammonia, strychnia, &c., with aromatics, as the nature of the case will allow. (*See Enemas.*)

CAUSTIC ALKALIES.—These include liquor ammonia, liquor potassæ, and liquor sodæ. When used as medicines they should be largely diluted, or extensive erosions of the mouth and fauces, and even poisoning, may occur.

CAUSTICS.—These include the mineral acids, chloride of zinc, lunar caustic, caustic alkalies, butyr of antimony, and the hot iron. Their use is indicated in sluggish wounds and too luxuriant granulations; warts also are sometimes removed by them.

CHALK is commonly used as a corrective for acidity of the stomach, and absorbent in diarrhœa and dysentery. It is generally combined with other astringents, a form of which follows:

CHALK MIXTURE. RECIPE NO. 180.

Take of prepared chalk	2 oz.
Powdered catechu or kino	1 ,,
Tincture of opium	1 ,,
Tincture of cardamoms	4 ,,
Water	16 ,,

Mix, and agitate well before administration. Four or five table-spoonfuls to be given to calves, two or three to sheep, and one to lambs with diarrhœa.

CHARCOAL.—Two kinds of charcoal are used in veterinary practice. *Animal Charcoal* is the result of subjecting bones, &c., to close combustion, when a black residue is left, which acts as a powerful deodorizer and antiputrescent. It is also a valuable antidote, when given largely in powder, against poisoning by strychnia, opium, and other vegetable substances containing an alkaloid. It should be rapidly agitated in milk or water, and poured quickly down the throat.

Wood or Vegetable Charcoal is the result of subjecting branches of trees to a smothered combustion. When powdered it is used for the same pur-

poses as the above, which it replaces with less cost but also less efficiency. Mixed with bran, &c., it forms an admirable poultice to deprive wounds of the feet, &c., of their offensive odour, and when strewn about the floors of stables, &c., answers the purpose of a deodorizer in the absence of more powerful agents.

CHLORIDE OF LIME.—Two to four drams for oxen and cows; one or two for sheep and large calves, rapidly mixed with flour and water, and poured down the throat of animals suffering from hoven, is the general treatment of many practitioners. It is also used in similar doses in dysentery. As a wash or lotion, the smaller quantities to a pint or quart of water destroy the foetor of offensive wounds, and promote their healing powers. Chloride of lime is a valuable deodorizer, disinfectant, and antiputrescent.

CHLORIDE OF ZINC.—(*See Zinc.*)

CHLOROFORM.—A valuable antispasmodic in suffering from pain of any kind, particularly of the bowels, and when attended with diarrhoea. It may be combined with opium, belladonna, or hyoscyamus, &c. To ensure speedy and permanent effects it should be given in small and oft-repeated doses in tepid gruel, ale, &c. Cattle, one ounce to twelve drams; sheep and calves, two to four drams; lambs and small pigs, half a dram to a dram three or four times a day. (*See Ether, Chloric.*)

CLYSTERS.—(*See Enemas.*)

COLOMBO.—A valuable stomach tonic or stomachic, given in loss of appetite, &c., combined with gentian, quassia, &c., which see.

COMMON SALT.—(*See Soda.*)

COPPER, COMPOUNDS OF.—There are few compounds of this metal in extensive use as a medicine.

Acetate of Copper (Verdigris) is used as a caustic in the form of powder, and as the old-fashioned remedy, *Ægyptiac*, which see.

Nitrate of Copper when dissolved in water forms an astringent lotion for diseases in the vicinity of the feet: four drams to a quart of water.

Sulphate of Copper is used for simple purposes, also as a caustic in powder, and internally as a tonic. Its use, however, requires great care. Doses, one to two drams for large animals; fifteen to thirty grains for the smaller ones.

CORDIALS are very commonly used by men of the old school, and often to the exclusion of more suitable remedies. They comprise the various seeds, as anise, carraway, ginger, cummin, coriander, &c., &c., with ale, porter, wines, spirits, &c. Properly combined, and during stages of convalescence, much good is derived; but care should be exercised, in order to limit their use during severe inflammations.

CORROSIVE SUBLIMATE.—(*See Mercury.*)

CROTON OIL AND SEEDS.—A valuable addition to linseed oil, salts, &c., in order to promote their action, and gain a speedy effect. (*See*

Catharsis.) The seeds are deemed equal to a like number of drops of the oil; the doses are therefore ten to thirty of either, according to the amount of constipation present. The seeds require thorough reduction to powder.

Croton oil is also used for the purpose of adding strength to blisters. The skin of cattle is very insensible to applications that would produce in the horse the most intense excitement and even blemishing; but croton oil acts powerfully. It is usually combined in the proportion of one part to ten or twelve of the ordinary fly preparations. It is sometimes dissolved in sulphuric ether and alcohol (page 240).

The following is a good blister for the ox:

BLISTER FLUID. RECIPE No. 181.

Take of olive oil	1 pt.
Powdered croton seeds	1 oz.
„ cantharides.....	1 „

Mix; and heat in a water bath for two hours, and when cool add spirits of turpentine one pint. The whole must stand twenty-four hours; then strain through linen or muslin.

DIGITALIS.—Powdered leaves of the digitalis, purpurea, or common fox-glove. Used as a sedative in heart diseases and dropsy attending them. The doses for large animals are thirty grains to one dram; small ones, ten to twenty grains, two or three times a day, combined with nitrate of potash. The powerful influence this substance is known to possess over the heart calls for great care in its administration, as early and rapid stoppage of that organ has been known to occur. It is given two or three times a day, during which the pulse must be frequently examined.



FIG. 217.—*Drenching Horn.*

DRENCHES, erroneously styled DRINKS.—A form of administration of medicines to cattle, sheep, pigs, &c. The ingredients are mixed with some fluid, as ale, porter, or gruel of various kinds; and by this method a more powerful and speedy action is supposed to be obtained. The probability is that the great quantity of fluid which is given aids materially in saturating the solid and dry contents of the compartments of the stomach, upon which the organ can act more readily. The medicines may also come in direct contact with the stomach, which is then stimulated by their action.

Drenches are usually administered by a horn, the base of which is trun-

cated or cut off so as to produce a long opening (Fig. 217). The head of the animal is raised a little above the level by an assistant who stands upon the left side, when the operator, having the horn ready filled, pulls away the cheek of the right side by the angles of the mouth (Fig. 218), which forms a pouch or pocket, and into this the medicine can be poured without the horn entering the mouth to its detriment, or danger of suffocating the



FIG. 218.—*Mode of forming a Pouch with the Cheek, to avoid passing the Horn or Bottle between the Teeth.*



FIG. 219.—*Oval Tin Drenching Bottle.*

animal. Many cowmen drench even large cattle without any assistance whatever, except a person to fill the horn from time to time. The horn, however, is now more generally superseded by a suitable bottle (Fig. 219) which may require filling but twice or three times, the animal being held in the manner first described by an assistant.

Pigs are readily drenched in two ways. When small, the animal is seized by both ears, placed between the legs, and raised a few inches from the ground (Fig. 220). Another person having an iron spoon, such as is used in the kitchen, and holding one or two ounces, and the medicine properly mixed in a basin, held in the left hand, pours a quantity from time to time within the mouth. The slight elevation at which the animal is held causes the mixture to pass towards the back of the mouth, and thus is swallowed, with alternate screams, easily, and without danger of choking him.



FIG. 220. — *Method of holding small Pigs for the administration of Fluid Medicines.*

Larger animals are seized by a running noose on a cord, and held to a

rail or post (Fig. 221). The medicine is poured in, as in the foregoing description, on the right side, the cord being raised by the left hand when the head is required to be elevated to a higher position. These animals seldom submit to being drenched quietly; but when held as described --although their dissatisfaction is marked by loud and deafening screams

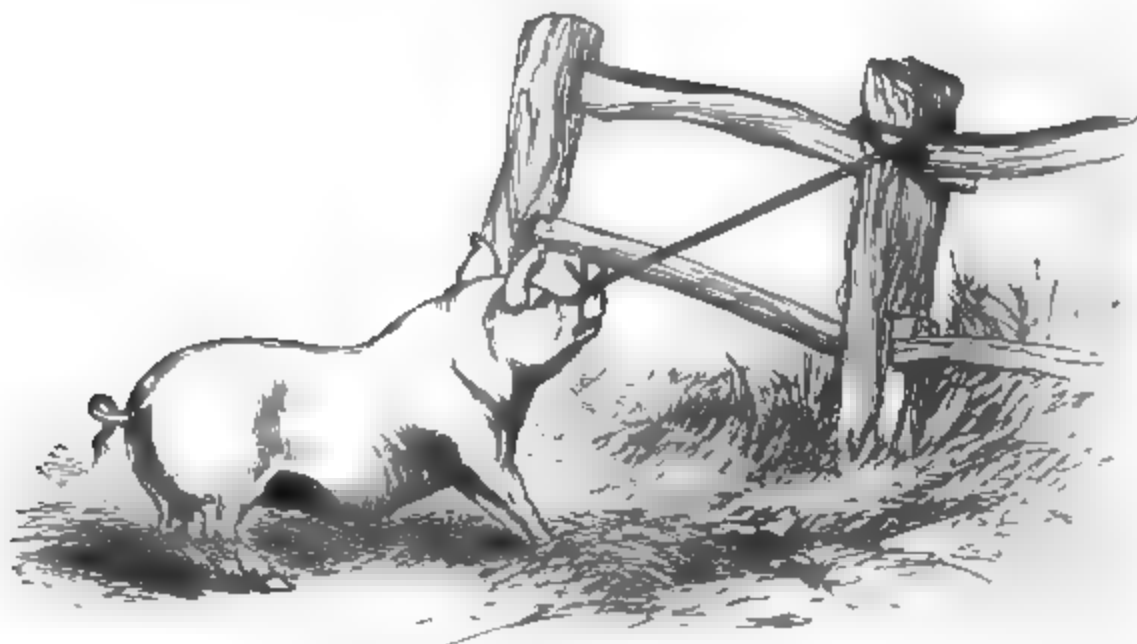


FIG. 221.—*The most efficient mode of securing large Pigs when Medicines are required.*

--small supplies from time to time are swallowed, the noise being gradually discontinued, with an amount of condescension rather remarkable in such an obstinate and excited quadruped.

EMETIC TARTAR. — (*See Antimony*).

ENEMAS, ENEMATA, CLYSTERS, LAVEMENTS, INJECTIONS are of three kinds: *simple, medicated, and gaseous.*

Simple Enemas are used to soften hardened accumulations of fœces in the rectum and assist in their discharge, as well as promote the general action (by stimulus) of the bowels. Their composition is usually warm water (96° to 100° F.) in which soap or common salt has been dissolved.

Medicated Enemas are intended also to produce a remote effect. In diseases attended with inability to swallow, locked-jaw, &c., in order to affect the nervous system, opium, turpentine, prussic acid, &c., &c., are added. They are useful in diarrhœa and dysentery, colic, &c., starch gruel and astringents being employed in the former, and opium, belladonna, chloroform, &c., in the latter. Articles of food are also sometimes included, and by them principally animals have been supported in severe diseases, and recovery dated therefrom in many instances.

The instruments used for their administration are various. The ancient

form consists of a bladder, tied upon a hollow wooden tube, suitably turned and rounded off to avoid injury. The bladder is filled by means of a funnel placed in the tube, and the whole emptied by pressure on the outside of the bladder, when the tube has been inserted in the rectum. An apparatus similar to this, but having a caoutchouc bag, is now made by the surgical instrument maker.

Gamgee's Enema Funnel is a most simple yet useful instrument (Fig. 222). The tube is inserted within the rectum, and the fluid, poured into



FIG. 222.—*Gamgee's Enema Funnel, as modified by Dickinson.*

the funnel part, descends with a bubbling sound. Mr. Dickinson, of Boston, has improved this instrument by having the funnel made flat to fit the pocket.

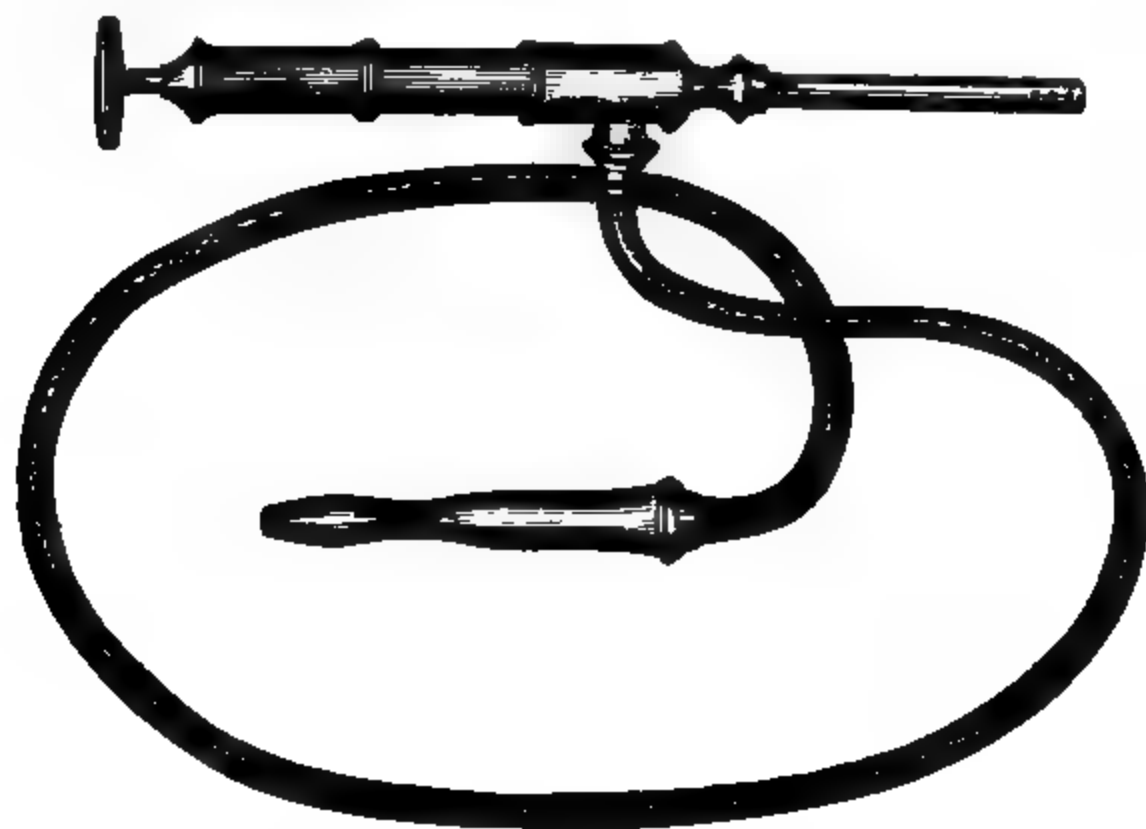


FIG. 223.

Ried's Patent Syringe is a very useful instrument (Fig. 223). The pump is used to force the fluid through the tube from the pail, which is placed

at some distance. The tube also proves useful in relieving tympanitis by being passed down the throat, and also for conveying fluids into or out of the stomach. A smaller size is made for dogs, &c.

Gaseous Enemas consist of the smoke or vapour of burning tobacco, opium, &c., which is passed within the rectum, and used in colic, severe spasm, strangulated hernia, tetanus, worms, &c., &c. For this purpose, Ried's patent syringe is fitted with a proper barrel or receptacle for the tobacco, &c., with which a few hot cinders are placed. A gust of air being drawn through by every stroke of the piston, suffices to drive also a copious volume of smoke. The apparatus is shown in the annexed engraving (*a*, Fig. 224).

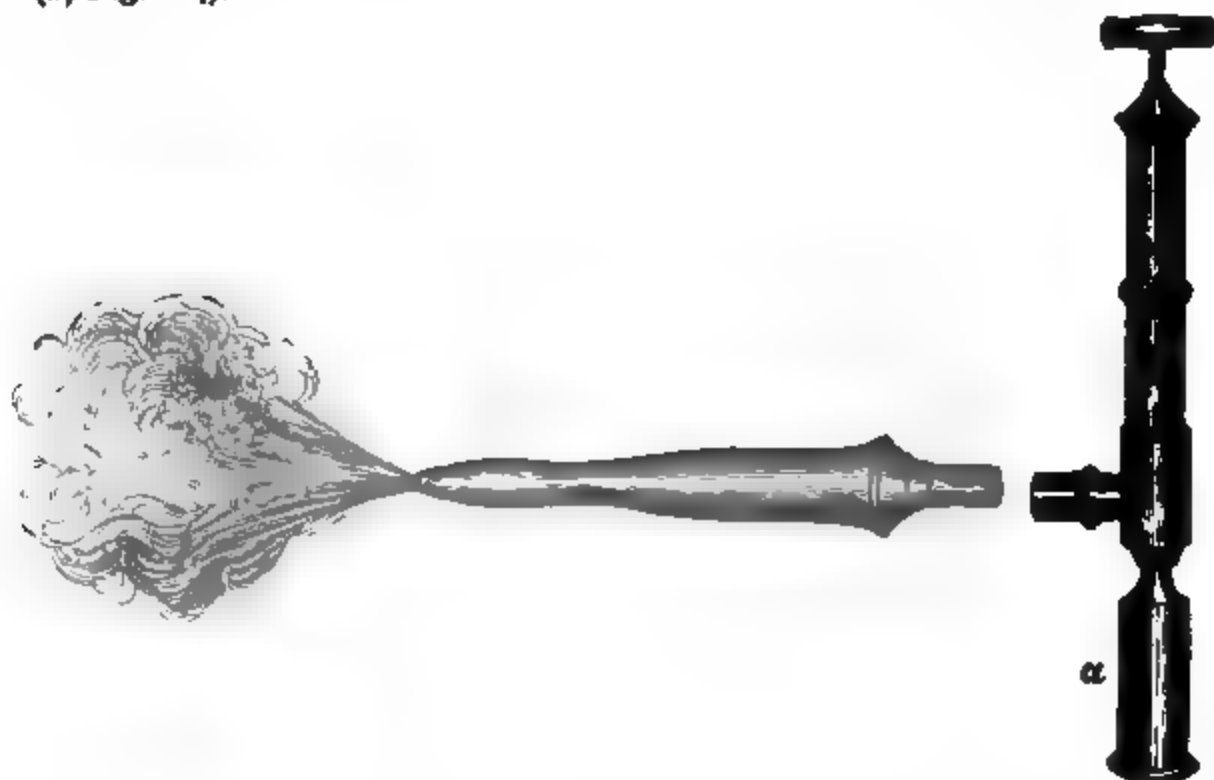


FIG. 224.—*Ried's Syringe, fitted with (a) the Barrel for burning Tobacco.*

EPSOM SALTS.—(See Magnesia.)

ETHER, CHLORIC.—A solution of chloroform in spirits of wine. A valuable stimulant and antispasmodic, used to replace chloroform, in similar doses.

ETHER, NITRIC.—Spirits of sweet nitre, similar to chloric ether. Doses: Two to four ounces for large animals; two to eight drams for small ones.

ETHER, SULPHURIC.—A powerful sedative in large doses acting upon the brain and producing coma and death. In small doses, similar to those prescribed for chloroform, it is highly valuable for the same purposes. Being a good solvent for oils, it is used as a vehicle for the application of croton oil.

EXTRACT OF LEAD.—(See Lead.)

FOMENTATIONS.—The value of fomentations as remedial agents is not

generally known. In severe sprains, contusions, local inflammations, &c., they assist materially in restoring the circulation which has been arrested in the part, and thus prevent in the second-named condition the tendency to sloughing which so commonly follows.

To obtain the greatest effect, fomentations should be incessantly applied, and the temperature of the water used continually kept to the required elevation, viz.: 115° to 120° F. The proper mode is to secure a good supply, and by means of rugs, several of which are laid over the part affected, a stream of hot water is poured from the top, and by constant application, cooling is prevented. In severe cases three to six hours should be occupied in applying the water, after which dry rugs should be used, or the affected parts rubbed dry if the friction can be borne.

GENTIAN.—A good stomachic and tonic. It should always be fresh and properly powdered. When purchased in the latter form it is apt to be adulterated with flour. It improves the appetite and restores strength without affecting the pulse. It also promotes the action of purgatives, and is properly combined with ginger when prescribed with them. Doses: One to four or eight drams.

GINGER.—Another indispensable article of medicine in cattle practice. Ginger is carminative, stomachic, and tonic, and should enter into every purgative drench to avoid griping, which commonly ensues. Doses: One to three drams for small animals; one to two ounces for larger ones.

GLAUBER'S SALTS.—(*See Soda.*)

HARTSHORN, SOLUTION OF (in Water).—(*See Ammonia.*)

HELLEBORE, WHITE AND BLACK.—These vegetable substances possess very dangerous properties, and should never be used among domestic animals. More cases of poisoning occur than come to light, in which these agents have been the sole cause. Great depression, copious discharge of ropy saliva, exhaustion, small, weak, and frequent pulse, attempts to vomit occasionally, diarrhoea, dysentery, abdominal pain, &c., are among the signs of poisoning by them.

HONEY.—A useful vehicle for administering medicines in the form of electuary.—(*See Catechu.*)

HYOSCYAMUS, EXTRACT OF, possesses similar properties to belladonna, and is given for the same purposes in corresponding doses.

IODINE.—This substance is very useful in creating a more vigorous and perfect assimilation, and is used in those cases in which a want of that power results in diabetes and other irregularities of that nature. It is perfectly soluble in water containing the same weight of iodide of potassium, with which it should be prescribed and given before starchy food is allowed. Iodine is given in doses of one or two drams to cattle, and ten to thirty grains to smaller ones. Tincture of iodine is used externally for enlargements, to reduce them.

IODIDE OF POTASSIUM.—This must be viewed more as a compound of iodine than of potassium, but possesses an action upon the kidneys. It is given in similar doses and for the same purposes as iodine.

IODIDE OF LEAD.—This preparation is used in the form of ointment—one dram to an ounce of fresh lard—for the removal of tumours and other enlargements externally. It produces soreness and pain, and requires caution, as by absorption lead poisoning may be caused when extensively employed.

IRON.—Various compounds of this metal are used as tonics among the lower animals. Their well-known powerful influence has called them into great use and frequently to inconvenience. The Editor has witnessed horses and cattle suffering from emaciation, &c., produced by the preparations of iron when they were used with the object of producing tone and vigour. Iron should never be prescribed too early after acute inflammations, &c., as not only the above consequences may ensue, but also relapse may be produced. The compounds in use are—

The *Sulphate*.—Doses: Two to four drams for cattle; ten to sixty grains for smaller ones, given twice daily in the form of powder or drench.

The *Saccharated Carbonate*, used in the same form and doses.

The *Iodide of Iron*.—A very useful compound for sheep and young calves when the assimilative organs are disordered. Doses: One to two drams for cattle; thirty to sixty drops for young and smaller animals.

KINO.—A vegetable astringent allied to catechu; used in the same forms and doses.

LAUDANUM.—(*See Opium.*)

LEAD.—A few compounds of lead are used in cattle practice, the poisonous properties of the metal greatly prohibiting its use. The iodide has already been alluded to.

ACETATE or SUGAR OF LEAD.—This salt is used as a lotion—one ounce to a quart of water—for sprains, bruises, and surfaces that are inflamed. A few ounces of spirits of wine increase its refrigeratory powers.

DIACETATE OF LEAD (Goulard's Extract).—This is a more powerful application than the above. It is used for the same purposes, and being fluid, is mixed with olive oil to form lead liniment—two ounces to a pint of oil—which proves a good application to burns and scalds.

LINSEED.—A valuable article of diet for sick and weakly animals. Containing a fixed oil, it promotes assimilation, and proves laxative in moderate quantities, and on that account is resorted to in conjunction with roots to create an effect which is attended with less exhaustion than when produced by medicines. It is used as linseed gruel and cree'd linseed. The former is made by boiling a certain quantity in water, when a thick mucilaginous draught is obtained; but all the properties can be extracted by macerating one pound in one gallon of cold water, and frequent stirring

during twenty-four hours, half a pint of which may be given with other food once or twice a day. This is the form known as cree'd linseed.

LINSEED OIL.—A bland, slow purgative, very useful in cattle practice, in doses of one or two pints to large cattle, and two to eight or ten ounces for the smaller animals. The addition of a few drops of croton oil will render its action more certain.*

LUNAR CAUSTIC.—(See Silver.)

MAGNESIA, SULPHATE OF (Epsom Salts).—The general purgative for cattle and sheep. The doses are twelve to twenty-four ounces for adult cattle and those above one year old; up to one year, four to twelve ounces; sheep, two to six ounces; lambs, four drams to one ounce. To ensure effect less doses should be given, and the loss made up by the addition of croton, calomel, &c. (See Catharsis.) In pigs the doses given are the same as for sheep and lambs, according to size. It is either combined with calomel, gamboge, scammony, or jalap.

MASHES.—Sick animals are usually supplied with mashes for various purposes. Bran, mixed with warm water, proves laxative and cool; possessing no nutritive elements, it answers well during the existence of inflammation. Mashes of malt, barley, wheat, oats, peas, beans, turnips, and carrots are also used, but these are intended as pleasing articles of digestible food during convalescence.†

MERCURY.—The following are the compounds of this metal employed in medicine:

Calomel.—A purgative always combined with salts; never used alone, on account of its violence. Doses: Adult cattle, one to two drams; calves and stirks, ten to thirty grains; sheep and lambs, pigs, &c., three to twenty grains.

Corrosive Sublimate.—A powerful caustic. It is employed as an addition to sheep baths, but it is a most dangerous remedy, and should be discarded. In solution it forms a useful injection for troublesome sinuses, &c., but requires great care. The proportions are as follow:

CAUSTIC INJECTION FOR SINUSES. RECIPE NO. 182.

Take of corrosive sublimate	5 or 10 grs.
Muriatic acid	$\frac{1}{2}$ dr.
Distilled water	$7\frac{1}{2}$ fluid drs.

Mix; and when dissolved the mixture is ready for use.

Nitrate of Mercury, Ointment of.—When considerably diluted—one part to six or eight—this compound is very useful for lichenous diseases of the skin. Being very powerful, it must be carefully used.

* In occasional doses of one to three or four ounces it promotes digestion and assimilation.

† See "The Horse-Owner and Stableman's Companion." London: F. Warne & Co. Large edition.

Ointment of Mercury.—Only used in practice to mix with iodine ointment, to form a resolvent for chronic enlargements. If employed to kill lice or fleas, the animal should be well protected from it by being tied up, and only a small quantity must be used, as absorption may ensue.

MINERAL ACIDS.—These comprise *Nitric Acid* (aqua fortis), *Muriatic* or *Hydrochloric Acid* (spirits of salt), and *Sulphuric Acid* (oil of vitriol). Each of these is astringent and caustic when used externally, and internally astringent and tonic. Their external use is in the form of lotion or wash to foul ulcers, wounds, &c., and the mouth in aphthous diseases, foot-rot, foul, &c. The proportions are one to three or four drams to a pint of water. In the pure and undiluted form they are useful to restrain fungous granulations, warts, &c., and to destroy the parts bitten by rabid dogs. The doses internally are half a dram to two drams given in a pint or quart of water.

MURIATIC ACID.—(*See Mineral Acids.*)

MUSTARD.—This substance is of little service among cattle. As a slight irritant or stimulant it may answer in some instances, but for acute and extensive disease is utterly worthless. In the common form of its use, tepid water is mixed with it until a creamy consistence is obtained, but generally the mass is spoiled, or, as some think, improved, by the addition of turpentine, vinegar, &c. Where a speedy and desirable effect is necessary, more efficient agents must be had recourse to. (*See Cantharides.*)

NEUTRAL SALTS.—(*See Epsom Salts, Sulphate of Soda, Nitrate, Chlorate, and Sulphate of Potash.*)

NITRE.—(*See Potash.*)

NITRIC ACID.—(*See Mineral Acids.*)

NITRATE OF MERCURY.—(*See Mercury.*)

NITRATE OF POTASH.—(*See Potash.*)

NITRATE OF SILVER.—(*See Silver.*)

OAK BARK.—A useful astringent—a decoction of which may be mixed with catechu and kino in the purposes for which they are used.

OAK GALLS.—(*See Tannic Acid.*)

OPIUM.—A valuable remedy as an astringent and anodyne in diarrhoea, abdominal pain, and poisoning by acrid vegetables, &c., &c. It allays the spasms of tetanus, and restrains the violent efforts of cattle in difficult parturition. To adult cattle it may be given in doses of one to three drams; calves and year-olds, five grains to thirty; lambs and sheep, two to fifteen grains.

Tincture of Opium (Laudanum) is given in doses of one or two ounces to cattle; calves and stirks, one to four or six drams; lambs and sheep, ten to sixty or eighty drops.

ORIGANUM, OIL OF.—Usually added to blisters and liniments of the old school on account of its odour and supposed stimulative properties.

PEPPERMINT WATER.—A useful admixture to the medicines of cattle, calves, and sheep, when a warm aromatic stimulant is required.

PERMANGANATE OF POTASH (Condy's Fluid).—A very useful detergent and corrective to foul and tardy wounds, &c. It is mixed with five or six times its quantity of water.

POTASH, COMPOUNDS OF.—The following are used in veterinary practice :

The *Carbonate*.—A useful antacid in dyspepsia and wash in some skin diseases. Weak solutions are injected into the udder in mammitis. Doses, two to six drams for cattle; calves, sheep, and stirks, one to two drams.

Chlorate of Potash.—Same as the sulphate.

Nitrate of Potash.—A useful diuretic and sedative, in doses of three to six drams for cattle; one to three for calves and stirks; twenty grains to two drams for lambs and sheep.

Sulphate of Potash.—Given in one or two-ounce doses twice daily to cattle with severe inflammation. When thirsty, they will frequently take it in the drinking water: otherwise it is given in the form of drench.

POULTICES are sometimes used, but, as a rule, animals have a distaste for them. A sheet of *spongio-piline* is the lightest and most efficient application. It may be dipped in hot water and applied to the part by bandages, &c., without producing that feeling of discomfort that usually attends poultices which are heavy, and becoming dry, irritate the parts. *Spongio-piline* retains heat and moisture admirably on account of its outer sheet of waterproofing, and the inner thick layer of spongy substance.

Poultices are made of bran or linseed meal and water (hot); when much foetor exists, powdered charcoal is added: chloride of zinc in solution, chlorine water, &c., also answer the same purpose. Turnips, carrots, &c., are sometimes boiled and mashed for poultices; they, however, possess but slight advantages over bran, &c. Such contrivances as we sometimes see—viz., cow and human dung as poultices—are the device of filthy minds, and should never be countenanced where the health and safety of stock are considered.

QUASSIA.—When an infusion of quassia is at hand, it proves very serviceable as a vehicle for the administration of the ethers, mineral acids, preparations of iron, &c. The proportions are one ounce to a pint of boiling water, which is allowed to stand until cool.

RESIN.—Used to stiffen ointments, and internally as a diuretic, in doses of four or six drams to cattle.

RYE, ERGOT OF.—A medicine having a supposed specific action upon the womb, and requiring great caution in its administration, as poisoning may ensue. It is given to the cow in doses of one or two drams every fifteen or twenty minutes in ale or gruel. The ethers are more reliable.

SAL. AMMONIAC.—(See Ammonia.)

SALT, COMMON.—(*See Sodium.*)

SILVER, NITRATE OF (Lunar Caustic).—A proper remedy for foul wounds, ulcers, bites of rabid dogs, venomous reptiles, &c., applied in the solid form. In solution, three to ten grains to the ounce of water. It is used to remove opacity and ulceration of the cornea.

SODIUM, SALTS OF.—Several useful compounds of this metal are used in cattle practice: they are as follow:

Carbonate of Soda.—A useful antacid, which replaces the analogous salt of potash.

Chloride of Sodium (Common Salt).—A good condiment, but requires caution, as a dangerous plethora is frequently produced by its use. To pigs and other animals in large doses it acts as a speedy poison.

Sulphate of Soda (Glauber's Salts).—This is a purgative, but is generally superseded by Epsom salts. In doses of two to four ounces it is given to overcome violent and intense inflammations.

SOAP, SOFT.—Used with great advantage for cleaning the skin when diseased and after dressings have been applied. In proportion of one or two ounces to half a pail of warm water it forms a good enema or injection.

SPIRITS OF AMMONIA.—(*See Ammonia.*)

SPIRITS OF SALT.—(*See Mineral Acids.*)

SPIRITS OF WINE.—(*See Alcohol.*)

SQUILLS.—An expectorant. Useful with nitric ether, &c., in later stages of bronchitis, pneumonia, &c. Doses: Two to four drams.

SULPHUR.—An alterative in skin diseases: one to six drams daily. It also promotes the action of purgatives, and is given in doses of one to three ounces.

SULPHURIC ACID.—(*See Mineral Acids.*)

TANNIC ACID.—A crystalline astringent principle of great power, obtained from oak galls: very useful in restraining excessive mucous discharges, diarrhœa, hæmorrhage, &c. Doses: Thirty to eighty grains for cattle; stirks, half a dram to one dram; sheep and calves, fifteen to thirty grains. Of powdered oak galls, three to six drams for cattle; stirks, two to three drams; sheep and calves, one to two drams.

TAR, BARBADOES.—A very useful vehicle for applying the various strong acids to the foot in rot, foul, &c., and a good dressing to prevent the effects of undue moisture on wet lands, &c.

TEREBANE or PHENYLINE.—A principle obtained from coal tar, analogous to carbolic acid. Useful for foot-rot, foul, &c.

TINCTURE OF ALOES.—Mixed with an equal bulk of tincture of myrrh it forms a valuable healing fluid for wounds.

TINCTURE OF BENZOIN or BENJAMIN.—Used as the preceding.

TINCTURE OF CARDAMOMS.—A valuable stimulant and stomachic.

Doses: One or two ounces for adults; half and one-third for less animals.

TINCTURE OF MYRRH.—(*See* Tincture of Aloes.)

TOBACCO.—Formerly much used for the cure of skin diseases, but now rightly superseded by safer and non-poisonous dressings.

TREACLE.—Commonly used as a vehicle for medicines, as catechu, &c., in the formation of electuaries, and very properly accompanies purgatives to promote their action.

TURPENTINE.—Used as a stimulant externally and to increase the efficacy of blisters. The ordinary white oils are thus made:

WHITE OILS or LINIMENT. RECIPE NO. 183.

Take of olive oil	1 pt.
Liquor ammonia	1 oz.
Turpentine	2 „

Mix, and apply with smart friction.

Sometimes white of eggs, vinegar, &c., are added, and with such modifications the preparation is made to do duty as a patented or private nostrum, for which five times its value is charged.

Common Turpentine is used to mix with lard, and forms what is known as a “digestive ointment,” a preparation discarded by most practitioners. Turpentine is also used as a remedy against worms. (*See* Parasitic Diseases.)

VERDIGRIS.—(*See* Copper.)

VINEGAR.—(*See* Acetic Acid.)

VITRIOL, BLUE.—(*See* Nitrate of Copper.)

„ GREEN.—(*See* Sulphate of Iron.)

„ OIL OF.—(*See* Mineral Acids.)

„ WHITE.—(*See* Zinc.)

ZINC.—Four compounds of this metal are employed.

The *Carbonate* (Calamine), is used as an ointment in the proportion of one ounce to eight of lard to cracks in the skin, wounds, &c.

The *Oxide* as an absorbent powder, dusted over discharging surfaces. A mild astringent. Used also as an ointment to replace the carbonate.

The *Sulphate* (White Vitriol).—An astringent; used in the form of lotion—one ounce to a quart of water—for excessive discharges from mucous membranes, as “bull-burnt,” &c.

The *Chloride of Zinc*.—A stronger preparation than the above, used in the proportion of one or two drams to a quart of water.—*Ed.*]

THE LAMBING SEASON.

The lambing season depends wholly on the time when the tup is put to the ewes, which in general is so calculated that they should bring forth their young towards the latter end of February or the beginning of March. This is an inclement season both for the ewe and the lamb, especially if they have been badly kept for some time before yeanning. The consequence naturally to be expected on this occasion must be a severe loss amongst both the ewes and their offspring.

If the dam has not sufficient support for herself, the lamb in course will be weakly at the time it is brought forth. It is, therefore, indispensably necessary that all sheep-breeders should pay every attention to these animals that Nature and the season of the year may require. For a month or six weeks *at least* before the time of yeanning, they should be supplied with plenty of food, in order that Nature may provide for her offspring at the appointed time. If strict attention be paid to these observations, the health and strength of these animals will be preserved, by which they will be enabled to go through the difficulty of parturition.

Further, every farmer or grazier who is in the practice of breeding sheep should be properly provided with a fold-yard suitable for the purpose. It may consist of a small plot of ground, well protected from the north-east and westerly winds, with a suitable shade, and a fire-place in it, and other conveniences for the purpose. Thus the shepherd will be the better able to attend them at all hours of the night, to give his assistance if required, and to take proper care of them. By attending to these observations the lives of many will be saved. It frequently happens during the lambing season that ewes are severely handled through the largeness of the lamb, or its being in a wrong position, so as to bruise or tear the different parts of the uterus. It will be necessary to have in readiness at these times the following mixed oils :

RECIPE No. 184.

Take of Venice turpentine and Barbadoes tar, of each.....	4 oz.
Spirit of turpentine.....	$\frac{1}{2}$ pt.
Linseed oil	1 „

Mix these all well together ; then add the following :

Mel-Ægyptiacum	2 oz.
Oil of vitriol and aqua fortis, of each	$\frac{1}{2}$ „

Mix them together, and add

Tincture of myrrh	$\frac{1}{2}$ pt.
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Mix, and shake them all well together in a bottle for use.

Whenever these oils are used, let the bottle be well shaken, and the

1

Take of Peruvian bark and ginger, in powder, of each 1 dr.

Treacle	table-spoonfuls	2
Brandy.....	„	1

In every case where nature appears to be in a languid and debilitated state, nothing can equal the effect of these powders in restoring them. The gruel that is necessary to be given to ewes at the time of lambing should be made as follows :

Mix them together, and when gruel is wanted take a sufficient quantity of the powders and water; boil them together into gruel, in the same manner as if made of oatmeal alone; a table-spoonful or two of gin or brandy may be added, and a similar quantity of sugar.

This will give abundance of support to the animals, as well as nourish and heal their insides, through the richness of the seed being combined with the oatmeal. From half a pint to a pint of this gruel may be given at one time and repeated twice a day if necessary. If the ewe be deficient in her milk (which very frequently happens at the time of lambing, for want of better support,) let the following drink be given, which will be found greatly to assist those secretions:

**Take of aniseeds, sweet fennel-seeds, caraway-seeds, and grains
of paradise, of each I dr.**

Such persons as may find it necessary to give their sheep the above drink would find it more convenient to have three or four ounces of each, powdered and mixed together; and if they be not used in a few days, to

put them in a pot and tie them close down with a bladder. Half an ounce of these powders may be mixed and given as above at any time. By this method the whole virtue of the seeds will be preserved. This drink acts as a cordial, and powerfully promotes the milky secretions, at the same time it warms and stimulates the stomach and intestines.

[The necessity for close attention to breeding animals during the time of gestation cannot be too much insisted upon, but errors in this direction may and often do arise, in the excesses which are unconsciously indulged in. The supply of good food is essential, and as ewes advance in pregnancy they are unable to take sufficient exercise; the result is that unnatural and dangerous plethora which has already been discussed at page 128, and its end described under "heaving pains" so called, one of the anthracoid affections, of which agriculturists have hitherto been too sparingly informed. Great watchfulness is on this account needed. Improving condition should be gently regulated by diet of a laxative nature, carefully alternated with the daily allowance of corn, &c. When green food cannot be obtained, roots are imperatively called for in small and repeated quantities. When ewes are confined to the house or small folds, these particulars need close observance. Common salt as a condiment is here positively poisonous. Artificial preparations, known as spicy foods and condiments, are also worse than useless. The whole question becomes one of a highly scientific nature, and, known as *hygiene*, would profitably reward the stock-owner to a far greater extent than any amount of study in the treatment of disease. "Prevention is better than cure," and when the laws of health and principles of feeding and diet are more closely comprehended, thousands of animals will be saved that now suffer from disease, and their death hastened by physic, under a mistaken idea of curing it.

The great similarity of condition is also present in the cow during pregnancy. The happy medium between disaster from poverty and death from plethora is of great importance. Animals possess different constitutions; they appropriate food and endure confinement differently, and on this account should not be subject to a common or stereotyped plan. Treatment should be caused to minister to individual as well as general wants, and that of diet is all-important. Occasional laxatives are necessary if food fails to be obtained, or is insufficient for the purpose of correcting the functions of the body. Highly stimulating food and close confinement are destructive agencies. It is more consistent with health to provide moderate food, regular exercise, and a sharp appetite.—*Ed.*]

SUMMARY OF THE PREPARATIONS REFERRED TO
IN THE WORK.

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Acid Draughts, Nos. 20, 21, 22, 31, 32, 87, 88, 115, 117. 2. Anodyne Embrocation, 152, 172. 3. Anodynes. (<i>See</i> Opiates.) 4. Antacids, 50, 79, 80. 5. Antiseptics, 36, 45, 47, 48, 49, 70, 100, 101, 106, 107, 130, 132—135, 178. 6. Antispasmodics, 11, 41, 144. 7. Astringent Draughts, 11, 30, 32, 34, 35, 38, 66, 72, 82—86, 92—97, 114—120, 125, 180. 8. Astringent Washes or Lotions, 38, 44, 47, 51, 57, 66, 67, 73, 106, 148, 149, 162, 163. 9. Blisters, 7—10, 62, 181. 10. Caustic Dressings and Injections, 18, 45, 148, 149, 182. 11. Cooling Lotions, 2—6, 56, 164, 165, 166, 169, 170, 171. 12. Cordials, 89—91, 126. 13. Electuaries, 15, 179. 14. Injections (Endermic), 104, 140, 141. | <ol style="list-style-type: none"> 15. Injections (Enemas), 100, 103, 139. 16. Laxatives, 19, 25, 33, 43, 52, 61, 81, 88, 89, 101, 110—112. 17. Ointments, 51, 151, 154, 157, 158, 172. 18. Opiates, 11, 30, 51, 83, 84, 85, 86, 92, 94—98, 118, 119, 123. 19. Purgatives or Cathartics, 12, 29, 37, 39, 40, 41, 71, 74, 76, 108, 114, 123, 124, 137, 150. 20. Salines (Fever Draughts), 1, 15, 27, 53, 56, 58, 88, 109, 110, 112, 150. 21. Sedatives (also Fever Draughts), 11, 14, 26, 27, 55, 59, 61, 63, 64, 127, 138. 22. Stimulants, 11, 23, 24, 42, 54, 60, 68, 72, 73, 75, 77, 91, 95. 23. Stimulating Embrocations, 13, 16, 152, 172. 24. Tonics, 17, 21, 22, 28, 32, 46, 65, 68, 74, 88, 142, 146, 147. |
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EXPLANATION OF THE TERMS USED THROUGHOUT
THE WORK.

A.

Abnormal. Unnatural; contrary to a natural or healthy state.

Adventitious. Generally applied to false membranes, or other products of a present or previously diseased state.

Ad libitum. At one's pleasure; at pleasure.

Alkali. A substance having opposite qualities to an acid. The alkalis are potash, soda, and ammonia.

Alkaline. Having the action and other essential properties of an alkali, which consist in saponifying oils, uniting with acids to form a salt, and turning vegetable reds to purple, and yellows to brown.

Alkaloid. The active principle of vegetable medicines and poisons.

Alvine Evacuations. The discharges from the intestines.

Amaurotic, Amaurosis. A state of blindness due to disease of the optic nerve, and frequently observed as a symptom of other diseases.

Anasarca, Edema. Fluid within the

cellular tissue, &c., beneath the skin, which leaves after pressure the impression of the fingers.

Anchylosis.—Union of the bones of a joint by ossific matter thrown out during inflammation.

Antiputrescent. An agent which prevents putrid odours.

Antiphlogistic. That which lowers the inflammatory action.

Antiseptic. (*See* Antiputrescent.)

Anus. The fundament.

Areolar. (*See* Cellular.)

Aphthous. Vesicles or blisters and their crusts inside the mouth, or on other mucous membranes.

Aplastic. Having no power to become part of the healthy body.

Apnæa. Suspended respiration.

Arthritis. Inflammation of joints.

Asthenic. Applied to a low and weak form of inflammation or fever.

Astringents. Those agents which constringe or contract parts.

Atrophy. Wasting of organs.

Auricle. One of the superior cavities of

the heart which *receives* blood. (See Ventricle.)

Auriculo-ventricular Opening. The orifice, guarded by valves, which connects the auricles and ventricles of the heart.

Auscultation. The practice of detecting the sounds made in circulation or respiration by applying the ear to various parts of the chest.

Autopsy. A *post mortem* or after-death examination.

B.

Borborygmus. A rumbling noise in the bowels caused by the presence and passage of gases.

Buccal Membrane. The lining membrane of the mouth and covering of the tongue, &c.

C.

Cachexia. A vitiated or unhealthy condition of the body, from which certain special diseases are likely to follow.

Cadaveric Rigidity. Death stiffening.

Canula. The tube used with the trocar.

Cancerous, Carcinomatous. Having the nature of cancer; malignant.

Cardiac. Belonging to the heart.

Carminatives. Medicines which dispel wind.

Cathartic. A brisk purgative.

Cellular Tissue. The reticulated or cell-like substance that unites the skin to the body, and muscles, &c., to each other.

Centum Ovale. The white or medullary portion of the brain.

Cerebral Complications. The state of the brain and nervous system when affected by disease already existing in other parts. (See Coma.)

Coma. Insensibility: generally due to impure blood passing through the brain, constituting a state of blood poisoning.

Congenital. A condition of disease or malformation existing at birth.

Constitutional Disturbance. The interference with general functions, as symptomatic fever, &c.

Conjunctiva. The membrane which invests the eyeball in front, and lines the eyelids.

Cornea. The transparent part of the front of the eyeball.

Crepitation. A crackling sound heard in disease of the lungs, fractures of bone, &c.

Cul-de-sac. A little bag or blind pouch.

D.

Deodorizer. Having the power of destroying foul odours.

Depilation. Dropping off of the hair, &c.

Depletive. Same as antiphlogistic—lowering.

Depurant. An agent that purifies the blood.

Desquamation. Falling off in scales.

Detergent. Cleansing.

Dewlap. The pendulous part of the skin of cattle at the bottom of the neck.

Diaphoretic. Having the power of causing perspiration.

Diaphragm. The fleshy partition between the stomach and abdomen—the main agent in respiration.

Desiderata. Conditions or things imperatively called for.

Diathesis. (See Cachexia.)

Disinfectant. An agent that destroys the contagious or infectious matter of disease.

Dysorexia. A depraved appetite.

Dyspnoea. Difficulty of breathing.

E.

Ecbolic. An agent supposed to possess a specific action on the womb by which its contents are expelled.

Ecchymosis. Blood effused in small spots beneath investing membranes, or within the structures of organs. (See Extravasation.)

Eburnation. An ivory appearance on bones, produced by disease, or when two broken surfaces play over each other after the opportunity for union has passed.

Embrocation. A liniment or application having stimulative properties.

Emphysema. Air in the cellular tissue of organs or beneath the skin.

Endermic Method. The system of injecting medicines beneath the skin.

Enemata. Enemas; injections.

Enzoötic. Diseases which affect a number of animals in a district.

Epidermis. The scaly or outer portion of the skin; the cuticle.

Epileptic, Epileptiform. Relating to, or having the nature of epilepsy.

Epithelium. The scaly portion of the skin or mucous membranes.

Episoötic. A contagious disease of foreign origin affecting animals of all ages and breeds of one class.

Estromania. Disease of the ovaries in cows, giving rise to a constant desire for the bull.

Exacerbation. An increased return of the symptoms of disease; a paroxysm.

Extravasation. Extensive effusion of blood in consequence of rupture of blood-vessels.

F.

Fætor. A bad smell; the odour of sloughing and putrefaction.

Foramen Ovale. The orifice which exists before birth in the partition between the auricles of the heart.

G.

Gestation. The period during which females carry the young in the womb.

Granulations. The sprouts of flesh which are seen in healing wounds.

H.

Hectic. A low febrile state characterized by sinking and wasting at the termination of incurable diseases.

Hemiplegia. Paralysis or uselessness of one side or half of the body.

Hydatid. A cyst containing a clear fluid, and usually also a worm.

Hypertrophy. An enlargement due to morbid or diseased action.

I.

Idiopathic. A disease arising from peculiar and proper causes, having no dependence upon a wound, other disease, or obvious cause for its origin, is said to be idiopathic.

Idiosyncrasy. Peculiar liability to certain agencies, which are not present in many other individuals.

Incubation, Period of. The time during which a contagious disease is present in the body before any symptoms are developed.

Ingesta. Food, &c., within the digestive organs.

Iris. A contractile muscular membrane pierced in the centre by an oblong opening, and stretched across within the eye behind the cornea, forming the pupil and regulating the access of light.

L.

Lithontriptics. Medicines (acids) given with the supposed view of dissolving stones in the urinary organs or their passages.

M.

Mammalia, Mammals. Animals that suckle their young.

Medulla Oblongata. That part of the spinal cord or marrow that joins the brain.

Metastasis. The change of inflammation from one part of the body to another.

Modus Operandi. The mode of proceeding or of setting to work.

N.

Normal. In a state of health and proper function.

Nucleus. The point or foreign object around which morbid accumulations of matter aggregate, as a calculus or stone in the bladder, stomach, or intestines.

Nymphomania. (See *Estromania*.)

O.

Omentum. The caul or loose parts of serous membrane, known also as the "peritoneum."

Ovary. The female testicle.

P.

Papulae, Papular. Elevations of the skin—small, pointed, and undergoing inflammation.

Paraplegia. Paralysis of the fore or hind half of the body.

Parasites. Insects, worms, &c., infesting various parts of the body.

Pari passu. In the same degree; with equal pace.

Per se. Of itself; by itself; in itself.

Peritoneum. The membrane which lines the abdomen, and invests the organs within it.

Petechiae. Purple spots or points on the various membranes, seen in diseases characterized by blood poison. Similar to ecchymosis.

Phlebitis. Inflammation of a vein.

Plegmon. Circumscribed inflammation tending to abscess.

Pleura. The membrane which lines the chest and covers the organs within it.

Polydipsia. Intense thirst.

Proctorrhæa. Fæces or dung, mucous, &c., covered with blood from the rectum.

Prognosis. An outline of the future progress of disease.

Pulmonary. Relating to the lungs.

Puncta Vasculosa. Small spots of blood oozing from the brain when its substance is divided.

Purgatives. Medicines that open or increase the action of the bowels.

Q.

Quarantine. Really forty days; the prescribed time during which men or animals arriving from countries affected with contagious disease are prevented from having intercourse with the inhabitants of another country.

R.

Rectum. The terminal or last straight gut.

S.

Sanguineous. Bloody; having the colour of or admixture with blood.

Scolex, Scolices. A pregnant part or parts of tapeworm, which are thrown off at regular periods for the propagation of the species.

Secernation. Purification.

Sedatives. Medicines that lower the action of the heart and suppress fever.

Segregation. Separation and isolation of animals to avoid intercourse and prevent the spread of contagious diseases.

Sero-sanguineous. Having the nature of blood and water.

Sporadic. Diseases common to isolated districts, affecting few animals, dependent on common causes, and totally apart from contagion.

Stasis. Blood in a state of inflammation, or fluids unable to move.

Sthenic. Active, violent; relating to fever or inflammation, as opposed to asthenic.

Stomachics. Stomach tonics.

Styptics. Agents that stop bleeding.

Sub-acute. Diseases that take on the second or protracted form, as opposed to sthenic or acute—vigorous and rapid.

Subcutaneous. Beneath the skin.

Suppository. A solid medicine introduced into the rectum.

Suppuration. The formation and discharge of pus-matter, from an abscess or surface of membranes, &c.; purulent secretion. When mucous is also present it is termed "muco-purulent."

Suture. An appliance for uniting wounds.

Syncope. Fainting.

T.

Therapeutics. Curative measures.

Thorax. The chest.

Tonic. A medicine that increases the tone and vigour of the body.

Traumatic. Caused by or dependent upon a wound.

Trephine. An instrument like a cylindrical saw, by which circular pieces of bone can be taken out.

Trismus. Inability to open the jaws; locked-jaw.

Trocar. The stilette by which the canula is caused to pass into cavities for the evacuation of fluids.

Tubercular. Having the nature of tubercles or irregular diseased masses.

Tympanitis, Tympany. Distension of the stomach or intestines with gas.

Typhoid. Of the nature of typhus; low, sub-acute.

U.

Umbilical Cord. The navel-string.

Umbilicated. Depressed like the navel.

Urachus. The foetal passage for the urine from the bladder through the navel to the membranes of the womb of the mother.

Urethra.—The passage or canal in the adult male through which urine is discharged from the bladder, terminating outwardly at the penis.

V.

Vagina. Entrance to the womb.

Vena Portæ. The vessels which receive the blood from the abdominal organs and convey it to the liver.

Ventricles. Cavities of the heart which receive blood from the respective auricles, right and left. One discharges the blood to the lungs for purification; the other, after receiving it from thence, discharges it over the system.

Vertebrae. The back-bones.

Vertigo. Giddiness; swimming in the head, so called.

Vesicular. Having the nature of vesicles or blisters.

Virus. The morbid element by which disease is transmitted; a substance not appreciable by the senses.

Viscera. Organs contained within a cavity of the body, as the heart, lungs, intestines, &c.

Visible Mucous Membranes. The membranes of the eyes, nose, mouth, rectum, and vagina in females.

INDEX.

A.
 Abdominal dropsy in calf, 415.
 Abortion, 399.
 Abscess of bone, 77.
 „ kidneys, 382.
 „ lungs, 241.
 „ tongue, 267.
 Abstraction of blood, 39.
 Acari, 543.
 Acid draughts, 69.
 Acids, mineral, as disinfectants, 212.
 Accidental poisoning, 610.
 Accommodation in cattle boats, 191.
 Acts relating to contagious diseases, 190.
 Acute dysentery, 316.
 „ inflammation, 24.
 „ tympanitis, 269.
Adynamia nervosa generalis, 459.
 Affections of reticulum, 288.
 After-birth, 417.
 After-pains, 416.
 Agents, disinfectant, 211.
 Air of buildings: how to purify, 214.
 Albugo, 583.
 Albumen in hæmaturia, 85.
 Albuminuria, 368.
 Albuminous urine, 368.
 Anæmia, 50.
 Anæmic palpitation, 468.
 Angina, 227.
 Angle-berries, 498.
 Animal, infected, 145.
 Anthracoid diseases, 119.
 Anthrax fevers, 99.
 „ in the pig, 115.
 „ of the skin, 495.
 Appearance of pleuro-pneumonia epizootica in England, 155.
 Aphtha, epizootic, 158.
 „ or thrush, 264.
 „ vesicular, 158.
 Apnoea, 56.
 Apoplexy, 445.
 „ parturient, 119.
 „ in pigs, 117.
 „ splenic, 105.
 Appendix, 619.
 Arteries, arrest of circulation in, 476.
 „ wounds in, 594.
 Atrophy of kidneys, 382.
 Arthritis in lambs and calves, 75.
 Ascites in calf, 415.
 Asthenic inflammation, 24.
 „ hæmaturia, 79.

Astringent mixtures for diarrhoea, 314.
 Auscultation in pleuro-pneumonia epizootica, 145.
 Australia, pleuro-pneumonia in, 144.

B.
 Bacteriæ, 105.
 Bandage, many-tailed, 33, 592.
 Barlow, John: his definition of puerperal fever, 422.
 Bath for sheep, 559.
 Bellows, sound, 475.
 Black-leg, 99.
 „ water, 79.
 Bladder, inflammation of, 385.
 „ inversion of, 396.
 Blain, 111.
 Blasted, 269.
 Bleeding cancer, 584.
 Blisters, 158.
 Blood, 3.
 „ abstraction of, 39.
 „ diseases, 45.
 „ „ classification of, 46.
 „ „ of lambs, 127.
 „ circulating, 8.
 „ coagulated, 4—6.
 „ density of, 4.
 „ discs, 4.
 „ excess of, 48.
 „ fungous, 584.
 „ in inflammation, 22.
 „ striking, 105.
 „ temperature of, 6.
 „ want of, 50.
 Bloodless state, 50.
 Bloody urine, 372.
 Blown, 269.
 Blue disease, 471.
 Bone, abscess of, 77.
 „ healthy, 77.
 „ fibro-plastic, degeneration of, 64.
 „ fragility of, 305.
 Bowels, consumption of, 60.
 Brain, inflammation of, 144.
 Braxy, 108.
 Breech presentation, 412.
 Bronchitis, 231.
Bruit-de-souffle, 475.
 Buffy coat of blood, 23.
 Bull-burnt, 433.
 Buildings, to purify the air in, 214.
 Bullous eruptions, 490.
 Burnett's disinfecting fluid, 211.

C.
 Cachexia aquosa, 515.
 „ hydatigena, 530.
 „ ossifraga, 305.
 Calculi or stones, 393.
 Calf, how to extract, 405.
 Calves, arthritis in, 75.
 Cancer, bleeding, 584.
 Cancers, 64.
 Cancerous ulcers, 62.
 Cankers, 64.
 Capillaries, 4.
 Carditis, 471.
 Carbolic acid as a disinfectant, 213.
 Carbuncular erysipelas, 99.
 „ fevers, 99.
 Catarrh or cold, 321.
 „ malignant, 70.
 „ symptoms of, 224.
 „ treatment of, 224.
 Catheter, 336.
 „ in parturient apoplexy, 123.
 Cattle boats, accommodation in, 191.
 „ how to drench, 626.
 „ imported, 184.
 „ plague, 138.
 „ „ conveyance of, 142.
 „ „ in Glasgow, 185.
 „ statistics of, 183.
 Catharsis, 623.
 Causes of anæmia, 50.
 „ asthenic hæmaturia, 79.
 „ catarrh, 222.
 „ croup, 230.
 „ carbuncular erysipelas, 100.
 „ fever, 17, 20.
 „ foot-rot, 501.
 „ inflammation, 27.
 „ introduction of epizootic pleuro-pneumonia to Britain, 155.
 „ plethora, 48.
 „ splenic apoplexy, 105.
 „ tympanitis, 279.
 Caustics, injection of, 66.
 Cellular tissue, diseases of, 497.
Cænurus cerebialis, 526.
 Cerebral poisons, 610.
 Cerebro-spinal poisons, 610.
 Charbon, 99.
 Chemical irritants, 610.
 Chest, drawing fluid from, 247.

- Chest, water in, 244.
 Chine-felon, 52.
 Chokered cows, 318.
 Choking, 277.
 Chronic dysentery, 318.
 " eczema, 488.
 " indigestion, 299.
 " inflammation, 24.
 " tympanitis, 276.
 Chloride of lime, its use, 209.
 " zinc, " 211.
 Chlorine gas: its use and how made, 210.
 Circulation of blood, 3.
Claveau, 171.
Clavelee, 171.
 Cleansing, the, 418.
 Clue-bound, 293.
 Clysters, 628.
 Cold or catarrh, 221.
 " felon, 52.
 " food, bad effects of, 80.
 Colic, 308.
 Common fever, 16.
 " inflammation, 24.
 Communication of aphtha to man, 168.
 Composition of poultices, 33, 635.
 Concretions of stomach, 288.
 Condition of Ireland as regards contagious diseases, 197.
 Condyl's disinfecting fluids, 216.
 Congestion, 27.
 " of the liver, 352.
 Conjunctivitis, 578.
 Consumption of the bowels, 60.
 Constipation, obstinate, in pigs, 297.
 " in cattle and sheep, 307.
 Constitution of urine, 359.
 Contagious diseases, 131.
 " " legislation in reference to, 190.
 " " mortality from, 179.
 " matter, 209.
 " diseases, prevention of, 187.
 " diseases, typhoid, 138.
 Contused wounds, 593.
 Conveyance of aphtha by butchers, 169.
 " cattle plague, 142.
 Cornea, opacity of, 583.
 Corneitis, 578.
 Corrosive irritants, 610.
 Coryza, 221.
 " gangrenosa, 71.
 Cooling lotions, 605.
 Copper, sulphate of, a disinfectant, 212.
 Cost of disinfecting agents, 213.
 Counter-irritants, 34.
 Cow-pox, 176.
 Crassamentum, 5.
 Creosote, a disinfectant, 213.
 Croup, 229.
 Croupous enteritis, 327.
 Cud, dropping the, 302.
 Cupped blood, 23.
 Cyanosis, 470.
Cysticercus cellulosæ, 530.
 Cystitis, 385.

 D.
 Dairies of Glasgow, losses in, 185.
 Danger from Irish stock, 157.
 Demic, 158.
 Density of urine, 358.
 Deposition, interstitial, 29.
 Dermatitis, 481.
 Dew-blown, 269.
 Diabetes, 362.
 Diagnosis of cattle plague, 138.
 " malignant catarrh, 74.
 Diarrhoea, 308.
 Diarrhoeemia, 126.
 Dickinson's sheep-dip, 559.
 " " a disinfectant, 215.
 " modification of Gamgee's enema funnel, 629.
 Difficulty of breathing, 57.
 Diffuse inflammation, 24.
 Disease of blood, 45.
 " foot and mouth, 158.
 " pulse in, 13.
 Diseased cattle: how disposed of, 201.
 Diseases, anthracoid, 119.
 " anthrax, 99.
 " of cellular tissue, 497.
 " digestive organs, 261.
 " enzootic, causes of, 96.
 " epizootic, 131.
 " organs of circulation, 467.
 " parasitic, 502.
 " respiratory organs, 221.
 " urinary organs, 355.
 Disinfection, 209.
 Disinfecting agents, cost of, 213.
 " fluids of Condyl, 216.
 " powder of McDougall, 215.
 Dislocation of patella, 602.
 Distemper in pigs, 115.
Distoma hepaticum, 518.
 Downfall of the udder, 435.
 Drench, laxative, 73, 641.
 Drenches, 626.
 Drenching-bottle, 626.
 Drenching-horn, 262, 626.
 Drop, the, 459.
 Dropping after calving, 119, 422, 459.
 " the cud, 302.
 Dropsy of the abdomen in calf, 415.

 Dry braxy, 108.
 Dumb, " 108.
 Duration of malignant catarrh, 74.
 " Purpura hæmorrhagica, 68.
 Dysentery, 315.
 Dyspepsia, 298.

 E.
 Early observation of cow-pox, 176.
Eau-de-Javelle, 211.
 Ecchymosis, 27.
 Eczema, chronic, 489.
 " epizootica, 158.
 " impetiginodes, 176.
 " simple, 488.
 Ecthyma, 494.
 Effusion, 29.
 Ellerman's disinfecting fluid, 211.
 Embolism, 476.
 Emphysema of the lungs, 252.
 Endocarditis, 474.
 Enemas, 628.
 Enema funnel and syringe, 629.
 Enteritis, 321.
 " croupous, 327.
 Enzoötic diseases, causes of, 96.
 " " treatment of, 120.
 Ephemeral fever, 17.
 Epidemic, 158.
 " cold, 221.
 Epilepsy, 446.
 Epizootic aphtha, 158.
 " diseases, 131.
 " eczema, 158.
 " pleuro-pneumonia, 143.
 " vesicular, 158.
 Erysipelas, 489.
 " carbuncular, 115.
 " carbunculosum, 99.
 Erysipelatous inflammation, 24.
 Erythema, 481.
 Eversion of the rectum, 334.
 Ewes, inflammation of udder in, 125.
 " parturition fever in, 125.
Exania, 334.
 Exanthema, 481.
 Excess of blood, 48.
 Exomphalus, 337.
 Extravasation, 27.
Exudativa contagiosa, 143.
 Eyes, diseases of, 577.

 F.
 Facial vein of sheep, 110.
 Fags, 555.
 Fainting-fit, 353.
 Fairs and markets, stoppage of, 207.
 Fardel-bound, 293.
 Fardon's sheep-bath, 558.
 Fatality of small-pox, 170.
 Feet, mode of dressing, 165.
 Felon, 221.

- Femoro-tibial articulation, injury to, 600.
 Fever, anthrax, 115.
 Fever, causes of, 17, 20.
 " common, 16.
 " pestilential, 138.
 " puerperal, 422.
 " sympathetic, 19.
 Fever, typhoid, 138.
 Fibro-plastic degeneration of bone, 64.
Filaria bronchiae, 510.
 Fistula of kidneys, 582.
 Fits, 446.
 Flooding, 420.
 Fluke disease, 515.
 Fog-sickness, 269.
 Fomentations, 32, 630.
 Foot and mouth disease, 158.
 Foot-halt, 499.
 Foot-rot, 499.
 Forms of choking, 277.
 " small-pox, 173.
 Foreign bodies in heart, 474.
 " rumen, 287.
 " cattle traffic, 136.
 " contagious diseases: their introduction, 199.
 " stock markets, 200.
 Foul, 502.
 Fractures, 597.
 Fragility of bones, 305.
 Frozen turnips, effects of, 80.
 Fungous hæmatodes, 584.
 Furuncular inflammation of skin, 495.
- G.
- Gamgee's enema funnel, 629.
 Gangrene of tongue, 267.
 Gastro-enteritis, 321.
 " in pigs, 115.
 Gangrenous inflammation, 125.
 General diseases, 219.
 Gid, 526.
 Glasgow dairies, losses of cattle in, 185.
 Glos-anthrax, 266.
 Glossary, 641.
 Gonorrhœa, 433.
 Grainsick, 282.
 Gravel, 387.
 Grunting garg, 293.
 Gullet, saccular dilatation of, 281.
 Gut-tie, 344.
- H.
- Hæmatopinus ani*, 555.
 " *vituli*, 555.
 Hæmaturia, 372.
 " asthenic, 79.
 Hæmo-albuminuria, 79.
 Hæmorrhage, 594.
 " after parturition, 420.
 Hæmorrhoids or piles, 336.
 Hand-ball spray distributor, 214.
 Hard pulse, 14.
 Hasty, 99.
 Hacks, cutting out the, 583.
 Haw, removal of, 583.
- Healthy bone, 76.
 Heart, 3, 9.
 Heart-bag, enlargement of, 476.
 " foreign bodies in, 474.
 " inflammation of, 471.
 " rupture of, 469.
 Heat, effects of, upon pulse, 12.
 " of inflammation, 24.
 Hefting, 436.
 Hemipligia, 450.
 Hepatitis, 352.
 Hernia, 337.
 Herpes, 492.
 " *circinatus*, 492.
 " *tonsurans*, 569.
 Hidebound, 497.
 Hippuric-acid, 389.
 History of contagious diseases, 133.
 " epizootic aphtha, 169.
 " epizootic diseases, 133.
 " small-pox, 170.
 Hog-cholera, 115.
 How diseased cattle are disposed of, 201.
 " to extract a calf, 405.
 " to secure poultices, 33, 635.
 " to use fomentations, 32, 631.
- Hoven, 269.
 Hoose, 508.
 Hoove or hove, 269.
 Husk, 508.
 Hydatids, 526.
 Hydrocephalus in calf, 415.
 " *hydatideus*, 526.
 Hydrophobia, 451.
 Hydrothorax, 244.
 Hydro-rachitis, 447.
 Hyperæmia, 352.
 Hypertrophy of heart, 476.
 " kidneys, 382.
 Hypochlorite of potash, a disinfectant, 211.
 " of soda, a disinfectant, 211.
- I.
- Idiopathic albuminuria, 370.
 " hæmaturia, 375.
 Ileus, 343.
 Impaction of rumen, 282.
 Impaired digestion, 299.
 Imperforate anus, 330.
 Impetigo, 492.
 " *erysipelatodes*, 176.
 " *facialis*, 493.
 " *labialis*, 493.
 " *larvalis*, 493.
 Importation of cattle, 184.
 " regulations for, 195.
 Improved sheep-baths, 559.
 Incised wounds, 589.
 Incontinence of urine, 368.
 Incubation of cattle plague, 138.
 " pleuro-pneumonia epizootica, 144.
- Indemnity against losses, 206.
 Indigestion, 268.
 Induration, 30.
 " of tongue, 267.
 Infected animal, 145.
 Inflammation, 21.
 " of brain, 444.
 " bladder, 385.
 " heart, 471.
 " kidneys, 378.
 " liver, 352.
 " lungs, 237.
 " stomach and intestines, 321.
 " tongue, 266.
 " udder in cows, 435.
 " udder in ewes, 439.
 Inflammatory fever, 99.
 Influenza, 321.
 Inguinal hernia, 342.
 Injections, 628.
 " beneath the skin, 90.
 " into the veins, 90.
 " of udder, 166.
 Injuries, local, 589.
 Injury to mouth, .
 " stifle joint, 60.
 " tongue, 266.
 Inoculation for epizootic pleuro-pneumonia, 154.
 Inspection, 202.
 Interrupted suture, 590.
 Interstitial deposition, 20.
 Intestines, inflammation of, 321.
 " invagination of, 343.
 Intestinal worms, 572.
 Intussusception, 343.
 Invagination, 343.
 Inversion of bladder, 396.
 " vagina, 427.
 " of womb, 428.
 Ireland, condition of, as regards contagious diseases, 197.
 Irish cattle, danger of, 157.
 Iron in urine, 85.
 " perchloride of, a disinfectant, 211.
 " sulphate of, a disinfectant, 212.
 Irregular pulse, 14.
 Irritants, 610.
Ixodes reticulatus, 555.
- J.
- Jaundice, 348.
 Jenner, Dr., his observations on cow-pox, 176.
 Joint-felon, 52.
 Joint-ill in calves, 75.
 " lambs, 75.
- K.
- Keds, 555.
 Kidneys, abscess of, 382.
 " atrophy of, 382.
 " fistula of, 382.

Kidneys, hypertrophy of, 382.
 " inflammation of, 378.
 Kinds of inflammation, 24.

L.
 Labarraque's fluid, 211.
 Labour, difficult, 405.
 " premature, 403.
 Lacerated wounds, 590.
 Lambing season, the, 638.
 Lambs, arthritis in, 75.
 Large or full pulse, 13.
 Laryngitis, 227.
 Laryngo-pharyngitis, 227.
 Lead liniment, 36.
 " Leighton - Buzzard Observer," editorial remarks on losses among cattle, 183.
 Legislation in reference to contagious diseases, 190.
 Leucorrhoea, 432.
 Lice, 553.
 Lime, oxalate of, in urine, 85.
 Lincolnshire dip, 559.
 Lithiasis, 387.
Liquor sanguinis, 5.
 Live stock importations, repeal of duty upon, 189.
 Local forms of consumption, 62.
 " inflammation, 24.
 " injuries, 589.
 Locked-jaw, 455.
 Loin-fallen, 459.
Losedurre, 138.
 Losses among stock, 98, 178.
 " from contagious diseases, 134.
 " indemnity against, 206.
 Lotions, cooling, 605.
 Louping-ill, 447.
 Low, the, 502.
Lungenseuche, 143.
 Lung-complaint, 143.
 Lungs, abscess of, 241.
 " emphysema of, 252.
 " inflammation of, 237.
 " structure of, 151.
 Lumbrices, 573.
 Lumbricoides, 573.
 Lymph, 26.
 Lymphatics, 26.
 " inflammation of, 497.

M.
 McDougall's disinfecting powder, 215.
 Maggots, 553.
Maladie-du-sang, 105.
Maladie rouge, 126.
 Malicious poisoning, 613.
 Malignant catarrh, 71.
 " sore throat, 87.
 Mammitis, 435.
 Mange, 543, 552.
 Manifolds, impaction of, 293.
 Mastitis, 435.
 Maw-bound, 282.
 Medicines, list of, 619.
Melophagus ovinus, 555.
 Metallic suture, 590.
 Method of removing urine from the ox, 367.

Metro-peritonitis, 422.
 Measles, 530.
 Mechi on losses among stock, 98.
Milsbrand, 105.
 Mineral acids, 69.
 " as disinfectants, 212.
 Mortality from contagious diseases, 179.
 " " rot, 518.
 Moor-ill, 321.
 Mortification, 30.
 Mouth, injuries to, 261.
 Movement of blood, 3.
Mylabris cichorii, 34.

N.
 Nature of malignant catarrh, 71.
 " " sore throat, 87.
 " navel-ill, 127.
 " parturient apoplexy, 119.
 " parturient fever in ewes, 123.
 " pleuro-pneumonia epizootica, 143.
 " purpura hæmorrhagica, 66.
 " rheumatism, 52.
 " rot, 520.
 " sanguineous ascites, 126.
 " small-pox, 172.
 " splenic apoplexy, 105.
 " tympanitis, 270.
 Navel-hernia, 337.
 " ill, 127.
 Nephritis, 378.
 Nervine poisons, 610.
 Nerving, an imposture, 105.
 Nervous debility in cows, 459.
 " system, diseases of, 443.
 Nettle-rash, 487.
 Non-poisonous dips, 559.
 Nostrils, how to steam, 225, 226.

O.
 Obstinate constipation in pigs, 297.
 Objectionable drenching-horn, 262.
 Oblique fracture, 597.
 Obstructions to the flow of urine, 364.
 " of the gullet, 277.
Oedema glottidis, 87.
Estrus bovis, 572.
 Oleine and glycerine dip, 559.
 Omasum, impaction of, 293.
 Opacity of cornea, 583.
 Ophthalmia, 577.
 " specific, 579.
 " superficial, 578.
 Organs of circulation, diseases of, 467.
 " generation, diseases of, 397.
 Origin of cow-pox, 176.
Ostea sarcoma, 64.
 Oxalate of lime in urine, 85.

P.
 Pain of inflammation, 25.
 Palpitation, anæmic, 468.
 Pancreas, 347.
 Pantas, 321.
Paracentesis thoracis, 246.
 Paralysis, 450.
 " of tongue, 267.
 Paraplegia, 450.
 Parasitic diseases, 507.
 Paronychia, 501.
 Parturition, apoplexy of, 119.
 " difficult, 405.
 " fever of, 119.
 " " in ewes, 123.
 " hæmorrhage after, 422.
 Patella, dislocation of, 602.
 Paunch, impaction of, 282.
 " opening of, 285.
 Peck-bound, 293.
 Pemphigus, 490.
 Pericarditis, 471.
 Peri-pneumonia, 143.
 Peri-pneumony, 237.
 Peritonitis, 329.
 Pestilential fever, 138.
 Petechiæ, 67.
 Phrenitis, 444.
 Phthisis, 58.
 " pulmonalis verminalis, 508.
 Phlebitis, 594.
 Phlegmonous inflammation, 24.
Picotte, 171.
 Pigs, anthrax fever in, 115.
 " apoplexy in, 117.
 " constipation in, 297.
 " how to drench, 627.
 Piles, 331.
 Piners, 60.
 Pins for securing wounds, 41.
 Placenta: how to extract, 417.
 Plenavia, 282.
 Plethora, 48.
 Pleuro-pneumonia, 143, 247.
 " epizootica, appearance of, in England, 155.
 " " auscultation in, 145.
 " " how to detect, 145.
 " " how introduced, 155.
 " " inoculation for, 154.
 " " *post mortem* appearances of, 149.
 " " stages of, 145.
 " " symptoms of, 145.
 Pleurisy, 242.
 Pleximeter, 145.
 Pneumonia, 237.
 " sporadic, 237.
 Poisoned flesh, 92.
 Poisoning, 610.
 " symptoms of, 611.
 " treatment of, 615.
 Poisonous sheep-dips, 556.
 Poisons, 609.
Pulmonia dei bovini, 143.

Polydipsia, 363.
Pourriture aigue, 126.
 Post or after-labour pains, 416.
Post mortem appearances of—
 Apnoea, 57.
 Apoplexy in pigs, 118.
 Blain, 113.
 Braxy, 109.
 Cattle plague, 140.
 Consumption, 61.
 Diarrhoea, 310.
 Diseases of third stomach, 297.
 Emphysema of lungs, 255.
 Epizootic aphtha, 167.
 Glos-anthrax, 113.
 Hæmaturia, 83.
 Hog cholera, 116.
 Malignant catarrh, 73.
 sore throat, 88.
 Navel-ill, 127.
 Nephritis, 380.
 Parturient apoplexy, 121.
 Pleuro-pneumonia epizootica, 149.
 Pleurisy, 245.
 Pneumonia, 239.
 Puerperal fever, 423.
 Purpura hæmorrhagica, 68.
 Sanguineous ascites, 126.
 Small-pox, 173.
 Poultices, 32, 635.
 Premature labour, 403.
 Preputial calculi, 395.
 Prevention of braxy, 110.
 " contagious diseases, 187.
 " enzootic diseases, 128.
 " parturient apoplexy, 124.
 Proctatresia, 330.
 Profuse urination, 362.
 Progress of rot, 524.
 " purpura hæmorrhagica, 68.
Prolapsus ani, 334.
 " *vagina*, 427.
 " *vesica*, 396.
 Protrusion of the rectum, 334.
 Prurigo, 488.
 Psoriasis, 489.
 Public slaughter-houses, 200.
 Puerperal fever, 422.
 " peritonitis, 422.
 Pulmonary murrain, 143.
 Pulse in disease, 13.
 " health, 9.
 " venous, causes of, 15.
 " where felt, 10.
 Pulsations, number of, 11.
 Punctured wounds, 593.
 Puncturing the paunch, 274.
Purpura hæmorrhagica, 66.
 Pus or matter, 29.

Q.
 Quackery in relation to science, 216.
 Quarantine, 198.
 Quarter-evil or ill, 99.
 Quick pulse, 13.
 Quilled suture, 599.
 Quinsy, 87.

R.
 Rabies, 451.
 Rapid pulse, 13.
 Renal calculi, 394.
 Rectum, protrusion of, 331.
 Redness of inflammation, 25.
 Red water, 79.
 " in sheep and lambs, 126.
 Remedies employed for dipping sheep, 562.
 Remedies employed for treatment of disease, 619.
 Report on losses among stock, 181.
 Repeal of duty on live stock importations, 189.
 Resolution, 28.
 Respiratory organs, diseases of, 221.
 Reticulum, affections of, 288.
 Retinitis, 579.
 Rheumatism, 52.
 Rheumatic fever, 52.
 Rinderpest, 138.
 Ringworm, 569.
 Rising pulse, 14.
 Round ligament, sprain of, 599.
 Rot in sheep, 515.
Rugcole, 171.
 Rumen, foreign bodies in, 287.
 " impaction of, 282.
 " opening of, 285.
 Rumenotomy, 284.
 Rupture, 337.
 " of heart, 469.
 " womb, 430.
 Russian cattle plague, 138.

S.
 Saccular dilatation of gullet, 288.
Sang-de-rate, 105.
 Sanguineous ascites, 126.
 Sanitary measures, 208.
 Sarcophaga carnaria, 555.
 Scab, 543.
 Scalesiasis, 530.
 Scalpel, 89.
 Scarlet fever, 94.
Schafblattern, 171.
Schafpocken, 171.
Schafpockenseuche, 171.
 Scirrhus, 30.
 Scrofula, 58.
 Scrotal hernia, 342.
 Second stomach, diseases of, 288.
 Secundines, 417.
 Segregation, 205.
 Serum, 4, 5.
 Setons, 37, 38.
 " in dewlap, 104.
 Sheep, after-pains in, 125.
 " bath, 559.
 " bleeding, 110.
 " dipping mixture, non-poisonous, of Dickinson, 559.
 " dipping and smearing, 556.
 " pox, 170.
 " ticks, 553.
 Simple or common fever, 16.
 " eczema, 488.

Simple irritants, 610.
 Syphon, teat, 166.
 Skin, anthrax of, 495.
 " diseases of, 481.
 " furuncular inflammation of, 495.
 Slaughter, 205.
 " -houses, 200.
 Slow or tardy pulse, 13.
 Small-pox, 170.
 " names for, 171.
 Soft pulse, 14.
 Sore teats, 484.
 " throat, 227.
 " udders, 435.
 Specific inflammation, 24.
 " ophthalmia, 579.
 Speed, 99.
 Spinal poisons, 619.
Spina ventosa, 64.
 Spleen or milt, 347.
 Splenic apoplexy, 105.
 Spongio-piline, 33.
 Sporadic or simple aphtha, 264.
 " pleuro-pneumonia, 247.
 " pneumonia, 237.
 Sprain of round ligament, 599.
 Spring lice, 488.
 Stages of cattle plague, 139.
 " hog-cholera, 115.
 " malignant catarrh, 72.
 " parturient apoplexy, 119.
 " pleuro-pneumonia epizootica, 145.
 " splenic apoplexy, 106.
 Staggers, 293.
 Staphyloma, 583.
 Statistics of cattle, 183.
 Steppe disease, 138.
 Sthenic hæmaturia, 375.
 " inflammation, 24.
 Stifle-joint, injury to, 600.
 Stimulants, 69, 70.
 Stings, 487.
 Stock, losses among, 98.
 Stomach or grass staggers, 293.
 " inflammation of, 321.
 " pump in parturient apoplexy, 123.
 Stones, 392.
 Stoppage of fairs and markets, 207.
 Strangulation of intestines in oxen, 344.
 Structure of lungs, 151.
 Sturdy, 526.
 Sulphate of copper, a disinfectant, 212.
 " iron, a disinfectant, 212.
 Sulphurous acid, a disinfectant, 212.
 Superficial ophthalmia, 578.
 Suppression of trade in diseased animals, 203.
 Suppuration, 29.
 Sutures, 590.
 Swelling, 26.
 Sweetbread, 347.
 Swimming in the head, 293.
 Symptoms of—
 Abortion, 401.

- Symptoms of—
 Anæmia, 50.
 Apnoea, 57.
 Arthritis, 75.
 Asthenic hæmaturia, 81.
 Blain, 112.
 Braxy, 108.
 Bronchitis, 231.
 Carbuncular erysipelas, 100, 101.
 Cattle plague, 138.
 Choking, 277.
 Constipation, 60.
 Cow-pox, 177.
 Croup, 229.
 Diarrhœa, 309.
 Dyspepsia, 300.
 Epizootic aphtha, 159.
 Foot-rot, 500.
 Gastro-enteritis, 322.
 Gut-tie, 344.
 Glos-anthrax, 112.
 Hog-cholera, 115.
 Impaction of the rumen, 282
 „ third stomach, 293.
 Inflammation, 24.
 „ of liver, 352.
 Jaundice, 349.
 Malignant catarrh, 76.
 „ sore throat, 87.
 Navel-ill, 127.
 Nephritis, 379.
 Parturient apoplexy, 119.
 Parturition fever in ewes, 125.
 Peritonitis, 329.
 Piles, 336.
 Plethora, 49.
 Pleurisy, 243.
 Pleuro-pneumonia epizootica, 145.
 Poisoning, 614.
 Pneumonia, 237.
 Puerperal fever, 422.
 Purpura hæmorrhagica, 66.
 Rheumatism, 52.
 Retention of urine, 366.
 Rot, 520.
 Sanguineous ascites, 126.
 Small-pox, 172.
 Sore throat, 227.
 Splenic apoplexy, 106.
 Sporadic pleuro-pneumonia, 250.
 Tympanitis, 270.
 Ulcerated tongue, 267.
 Uræmia, 56.
 Symptomatic fever, 19.
- T.
Tabes mesenterica, 60.
Tania serrata, 530.
 „ *solum*, 530.
 Tail-worm, the, 461.
 Tapeworms, 530.
 Tasmania, pleuro-pneumonia in, 144.
 Teat-syphon, 166.
 Teats, sore, 484.
 Temperament, effects on pulse, 12.
 Tenaculum, 89.
 Tendon, sprain of, 602.
- Terminations of inflammation, 28.
 Tetanus, 455.
 The yellows, 348.
 Thermometer, use of, in pleuro-pneumonia, 145.
 „ in parturient apoplexy, 126.
 Third stomach, diseases of, 293.
 Thrush, 264.
 Tic, 158.
 Tongue, abscess of, 267.
 „ injury to, 264.
 „ ulcerated, 266.
 Toxic agents, 609.
 Tracheotomy, how performed, 89.
 „ tube, 89.
 Trade in diseased animals, suppression of, 203.
 Transverse fracture of bone, 597.
 Traumatic albuminuria, 369.
 „ hæmaturia, 372.
 Treatment of—
 Abortion, 401.
 Abscess of lungs, 242.
 Anæmia, 51.
 Apnoea, 58.
 Apoplexy in pigs, 118.
 Arthritis, 78.
 Asthenic hæmaturia, 85.
 Braxy, 110.
 Bronchitis, 235.
 Cattle plague, 141.
 Carbuncular erysipelas, 102.
 Choking, 278.
 Constipation in pigs, 298.
 Cow-pox, 178.
 Croup, 230.
 Diarrhœa, 311.
 Dyspepsia, 301.
 Emphysema of lungs, 258.
 Epizootic aphtha, 163.
 Fever, 18, 20.
 Foot-rot, 502.
 Gastro-enteritis, 324.
 Glos-anthrax, 113.
 Glossitis, 266.
 Gonorrhœa, 434.
 Gut-tie, 345.
 Hog-cholera, 116.
 Impaction of rumen, 282.
 „ third stomach, 295.
 Inflammation, 30.
 „ of liver, 352.
 Jaundice, 350.
 Leucorrhœa, 433.
 Malignant catarrh, 74.
 „ sore throat, 88.
 Mammitis, 437.
 Navel hernia, 337.
 Nephritis, 380.
 Parturient apoplexy, 121.
 Parturition fever in ewes, 123.
 Peritonitis, 330.
 Piles, 336.
 Plethora, 49.
 Pneumonia, 240.
 Poisoning, 615.
 Puerperal fever, 423.
- Treatment of—
 Purpura hæmorrhagica, 68.
 Retention of urine, 366.
 Rheumatism, 54.
 Scrofula, 64.
 Sore throat, 229.
 Splenic apoplexy, 107.
 Sporadic aphtha, 265.
 „ p.-pneumonia, 252.
 Tympanitis, 270.
 Uræmia, 56.
 Ulcerated tongue, 267.
Trichodectes scalaris, 555.
 „ *sphærocephalus*, 555.
 Trismus, 455.
 True ringworm, 569.
 Tubercular consumption, 58.
 Turnips, effects of frozen, 80.
 Turnsick, 526.
 Twisted suture, 40, 590.
 Tympanitis, acute, 269.
 „ chronic, 276.
 Typhus in pigs, 115.
- U.
 Udder, downfall of, 435.
 „ inflammation of, ewes, 439.
 „ injection of, 166.
 „ mortification of, 439.
 Ulcerated tongue, 266.
 Ulceration, 29.
 Umbilical hernia, 337.
 Uninterrupted suture, 590.
 Uræmia, 56.
 Urea, 388.
 Urethral calculi, 394.
 Urinary calculi, 392.
 „ organs, 355.
 Urine, albuminous, 368.
 „ constitution of, 359.
 „ density of, 358.
 „ in asthenic hæmaturia, 84.
 „ incontinence of, 368.
 „ obstruction to the flow of, 364.
 „ retention of, 365.
 Urinometer, 359.
 Urogravimeter, 359.
 Urticaria, 487.
- V.
 Vagina, inversion of, 427.
 Vaginal catarrh, 432.
 Vaginitis, 432.
Variola ovina, 171.
 „ *vaccina*, 176.
Vaynole peccorino, 172.
 Veins, wounds of, 594.
 Venous pulse, 15.
 Ventilation, effects of bad, on pulse, 12.
 Ventral hernia, 343.
 Vertigo, 293.
 Vesical calculi, 394.
 Vesicular aphtha, 158.
 „ epizootic, 158.
 Vitulary fever, 119.
 Volvulus, 343.
 Von Siebold on Tapeworms, 533.

Index.

651

W.
Want of blood, 50.
Warbles, 571.
Water braxy, 108.
" in the chest, 224.
White oils, 637.
Whites, the, 432.
Wilful poisoning, 613.

Wood-evil, 321.
Womb, inversion of, 427.
" rupture of, 430.
Wounds, 589.
" of arteries and veins,
594.
Wournils, 571.
Worm in the tail, 461.

Worming, an imposture, 105.
Worms, 572.

^{2.}
Zungen-krebs, or *zungen-kar-*
bunkel, 111.

THE END.

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